Algebra I Regents Bimodal Worksheets

1 The following table shows the heights, in inches, of the players on the opening-night roster of the 2015-2016 New York Knicks.

84	80	87	75	77	79	80	74	76	80	80	82	82

The population standard deviation of these data is approximately

2 Olivia entered a baking contest. As part of the contest, she needs to demonstrate how to measure a gallon of milk if she only has a teaspoon measure. She converts the measurement using the ratios below:

$$\frac{4\text{ quarts}}{1\text{ gallon}} \bullet \frac{2\text{ pints}}{1\text{ quart}} \bullet \frac{2\text{ cups}}{1\text{ pint}} \bullet \frac{\frac{1}{4}\text{ cup}}{4\text{ tablespoons}} \bullet \frac{3\text{ teaspoons}}{1\text{ tablespoon}}$$

Which ratio is *incorrectly* written in Olivia's conversion?

3 The value of Tony's investment was \$1140 on January 1st. On this date three years later, his investment was worth \$1824. The average rate of change for this investment was \$19 per

4 David correctly factored the expression $m^2 - 12m - 64$. Which expression did he write?

5 The value of x which makes $\frac{2}{3}\left(\frac{1}{4}x - 2\right) = \frac{1}{5}\left(\frac{4}{3}x - 1\right)$ true is

6 The expression $4x^2 - 25$ is equivalent to

7 What is an equation of the line that passes through the points $(2,7)$ and $(-1,3)$?

8 When solving the equation $12x^2 - 7x = 6 - 2(x^2 - 1)$, Evan wrote $12x^2 - 7x = 6 - 2x^2 + 2$ as his first step. Which property justifies this step?

9 At an ice cream shop, the profit, $P(c)$, is modeled by the function $P(c) = 0.87c$, where c represents the number of ice cream cones sold. An appropriate domain for this function is

10 If $C = 2a^2 - 5$ and $D = 3 - a$, then $C - 2D$ equals

11 What is the solution to $2 + 3(2a + 1) = 3(a + 2)$?

12 The quadratic equation $x^2 - 6x = 12$ is rewritten in the form $(x + p)^2 = q$, where q is a constant. What is the value of p?

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13 A population of bacteria can be modeled by the function $f(t) = 1000(0.98)^t$, where t represents the time since the population started decaying, and $f(t)$ represents the population of the remaining bacteria at time t. What is the rate of decay for this population?

14 Students were asked to write a formula for the length of a rectangle by using the formula for its perimeter, $p = 2\ell + 2w$. Three of their responses are shown below.

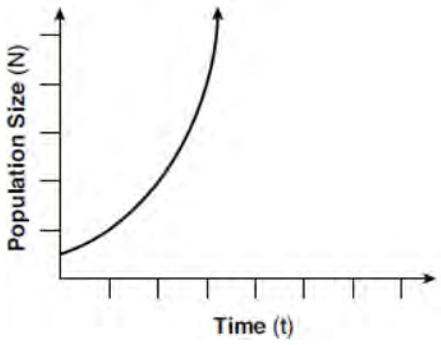
I. $\ell = \frac{1}{2}p - w$

II. $\ell = \frac{1}{2}(p - 2w)$

III. $\ell = \frac{p - 2w}{2}$

Which responses are correct?

15 Which type of function is shown in the graph below?



16 If $y = 3x^3 + x^2 - 5$ and $z = x^2 - 12$, which polynomial is equivalent to $2(y + z)$?

17 What are the zeros of $f(x) = (2x - 4)(3x + 4)$?

18 When solving $p^2 + 5 = 8p - 7$, Kate wrote $p^2 + 12 = 8p$. The property she used is

19 Which value of x makes $\frac{x-3}{4} + \frac{2}{3} = \frac{17}{12}$ true?

20 Students were asked to write $2x^3 + 3x + 4x^2 + 1$ in standard form. Four student responses are shown below.

Alexa: $4x^2 + 3x + 2x^3 + 1$

Carol: $2x^3 + 3x + 4x^2 + 1$

Ryan: $2x^3 + 4x^2 + 3x + 1$

Eric: $1 + 2x^3 + 3x + 4x^2$

Which student's response is correct?

21 Which domain is most appropriate for a function that represents the number of items, $f(x)$, placed into a laundry basket each day, x, for the month of January?

22 The length of a rectangular flat-screen television is six inches less than twice its width, x. If the area of the television screen is 1100 square inches, which equation can be used to determine the width, in inches?

23 Alicia purchased H half-gallons of ice cream for \$3.50 each and P packages of ice cream cones for \$2.50 each. She purchased 14 items and spent \$43. Which system of equations could be used to determine how many of each item Alicia purchased?

24 If $f(x) = 2(3^x) + 1$, what is the value of $f(2)$?

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25 Which of the equations below have the same solution?

I. $10(x-5)=-15$

II. $4+2(x-2)=9$

III. $\frac{1}{3}x=\frac{3}{2}$

26 The first term in a sequence is 5 and the fifth term is 17. What is the common difference?

27 Skyler mows lawns in the summer. The function $f(x)$ is used to model the amount of money earned, where x is the number of lawns completely mowed. A reasonable domain for this function would be

28 When the equation $\frac{x-1}{2}-\frac{a}{4}=\frac{3a}{4}$ is solved for x in terms of a, the solution is

29 When the function $g(x)=\begin{cases}5x, x\le 3\\ x^2+4, x>3\end{cases}$ is graphed correctly, how should the points be drawn on the graph for an x-value of 3?

30 Mike uses the equation $b=1300(2.65)^x$ to determine the growth of bacteria in a laboratory setting. The exponent represents

31 The amount of energy, Q, in joules, needed to raise the temperature of m grams of a substance is given by the formula $Q=mC(T_f-T_i)$, where C is the specific heat capacity of the substance. If its initial temperature is T_i, an equation to find its final temperature, T_f, is

32 When the expression $2x(x-4)-3(x+5)$ is written in simplest form, the result is

33 A company ships an average of 30,000 items each week. The approximate number of items shipped each minute is calculated using the conversion

34 Bamboo plants can grow 91 centimeters per day. What is the approximate growth of the plant, in inches per hour?

35 Joe has dimes and nickels in his piggy bank totaling \$1.45. The number of nickels he has is 5 more than twice the number of dimes, d. Which equation could be used to find the number of dimes he has?

36 If the function $f(x)=x^2$ has the domain $\{0,1,4,9\}$, what is its range?

37 The math department needs to buy new textbooks and laptops for the computer science classroom. The textbooks cost \$116.00 each, and the laptops cost \$439.00 each. If the math department has \$6500 to spend and purchases 30 textbooks, how many laptops can they buy?

38 At Benny's Cafe, a mixed-greens salad costs \$5.75. Additional toppings can be added for \$0.75 each. Which function could be used to determine the cost, $c(s)$, in dollars, of a salad with s additional toppings?

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39 At Berkeley Central High School, a survey was conducted to see if students preferred cheeseburgers, pizza, or hot dogs for lunch. The results of this survey are shown in the table below.

	Cheeseburgers	**Pizza**	**Hot Dogs**
Females	32	44	24
Males	36	30	34

Based on this survey, what percent of the students preferred pizza?

40 Which interval represents the range of the function $h(x) = 2x^2 - 2x - 4$?

41 Given: $f(x) = \frac{2}{3}x - 4$ and $g(x) = \frac{1}{4}x + 1$

Four statements about this system are written below.

I. $f(4) = g(4)$

II. When $x = 12$, $f(x) = g(x)$.

III. The graphs of $f(x)$ and $g(x)$ intersect at $(12,4)$.

IV. The graphs of $f(x)$ and $g(x)$ intersect at $(4,12)$.

Which statement(s) are true?

42 Ian is saving up to buy a new baseball glove. Every month he puts $10 into a jar. Which type of function best models the total amount of money in the jar after a given number of months?

43 What is the solution to $\frac{3}{2}b + 5 < 17$?

44 If $x \neq 0$, then the common ratio of the sequence $x, 2x^2, 4x^3, 8x^4, 16x^5, \ldots$ is

45 For the sequence $-27, -12, 3, 18, \ldots$, the expression that defines the nth term where $a_1 = -27$ is

46 The expression $\frac{1}{3}x(6x^2 - 3x + 9)$ is equivalent to

47 A high school sponsored a badminton tournament. After each round, one-half of the players were eliminated. If there were 64 players at the start of the tournament, which equation models the number of players left after 3 rounds?

48 Students were asked to write $6x^5 + 8x - 3x^3 + 7x^7$ in standard form. Shown below are four student responses.

Anne: $7x^7 + 6x^5 - 3x^3 + 8x$

Bob: $-3x^3 + 6x^5 + 7x^7 + 8x$

Carrie: $8x + 7x^7 + 6x^5 - 3x^3$

Dylan: $8x - 3x^3 + 6x^5 + 7x^7$

Which student is correct?

49 In a geometric sequence, the first term is 4 and the common ratio is -3. The fifth term of this sequence is

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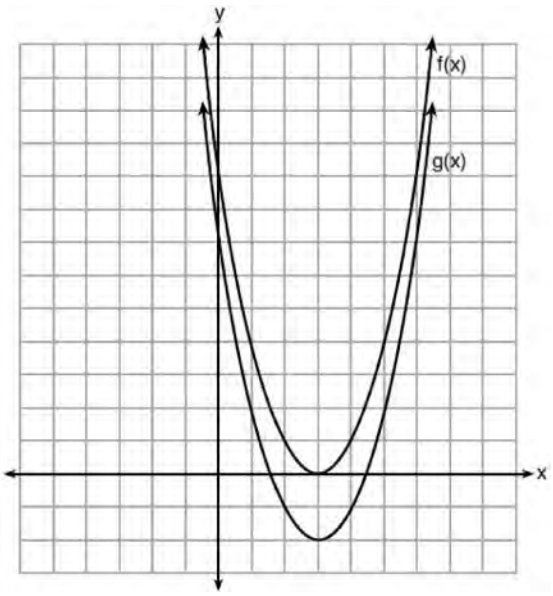
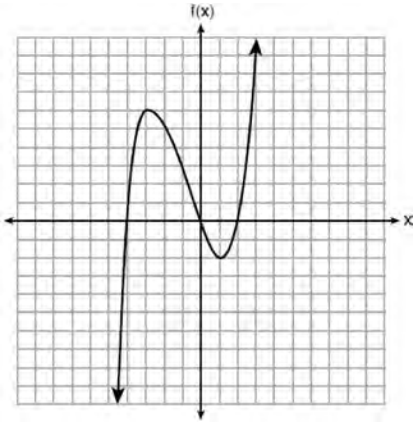
50 The functions $f(x) = x^2 - 6x + 9$ and $g(x) = f(x) + k$ are graphed below.



Which value of k would result in the graph of $g(x)$?

51 The graph of $f(x)$ is shown below.



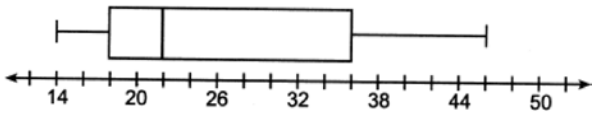
What is the value of $f(-3)$?

52 The zeros of the function $p(x) = x^2 - 2x - 24$ are

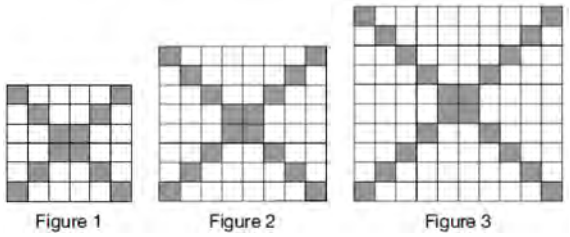
53 A high school club is researching a tour package offered by the Island Kayak Company. The company charges \$35 per person and \$245 for the tour guide. Which function represents the total cost, $C(x)$, of this kayak tour package for x club members?

54 A store manager is trying to determine if they should continue to sell a particular brand of nails. To model their profit, they use the function $p(n)$, where n is the number of boxes of these nails sold in a day. A reasonable domain for this function would be

55 What is the value of the third quartile in the box plot shown below?



56 The shaded boxes in the figures below represent a sequence.



If figure 1 represents the first term and this pattern continues, how many shaded blocks will be in figure 35?

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57 Jenna took a survey of her senior class to see whether they preferred pizza or burgers. The results are summarized in the table below.

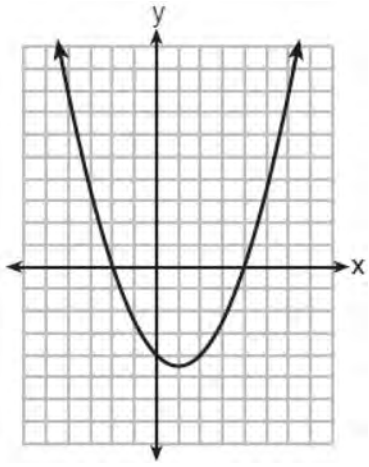
	Pizza	**Burgers**
Male	23	42
Female	31	26

Of the people who preferred burgers, approximately what percentage were female?

58 The domain of the function $f(x) = x^2 + x - 12$ is

59 If $f(x) = x^2 + 2x + 1$ and $g(x) = 7x - 5$, for which values of x is $f(x) = g(x)$?

60 The graph of $y = \frac{1}{2}x^2 - x - 4$ is shown below. The points $A(-2,0)$, $B(0,-4)$, and $C(4,0)$ lie on this graph.



Which of these points can determine the zeros of the equation $y = \frac{1}{2}x^2 - x - 4$?

61 If $k(x) = 2x^2 - 3\sqrt{x}$, then $k(9)$ is

62 Given: the sequence $4, 7, 10, 13, \ldots$
When using the arithmetic sequence formula $a_n = a_1 + (n-1)d$ to determine the 10th term, which variable would be replaced with the number 3?

63 Bryan's hockey team is purchasing jerseys. The company charges \$250 for a onetime set-up fee and \$23 for each printed jersey. Which expression represents the total cost of x number of jerseys for the team?

64 When $3a + 7b > 2a - 8b$ is solved for a, the result is

65 What is the solution to the equation $\frac{3}{5}\left(x + \frac{4}{3}\right) = 1.04$?

66 What is the equation of the line that passes through the point $(6,-3)$ and has a slope of $-\frac{4}{3}$?

67 The expression $36x^2 - 9$ is equivalent to

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68 What are the zeros of $m(x) = x(x^2 - 16)$?

69 Ian throws a ball up in the air and lets it fall to the ground. The height of the ball, $h(t)$, is modeled by the equation $h(t) = -16t^2 + 6t + 3$, with $h(t)$ measured in feet, and time, t, measured in seconds. The number 3 in $h(t)$ represents

70 The value of x that satisfies the equation $\frac{4}{3} = \frac{x+10}{15}$ is

71 If $f(x) = x^2 + 2$, which interval describes the range of this function?

72 The expression $\left(3x^2 + 4x - 8\right) + 2(11 - 5x)$ is equivalent to

73 Caitlin graphs the function $f(x) = ax^2$, where a is a positive integer. If Caitlin multiplies a by -2, when compared to $f(x)$, the new graph will become

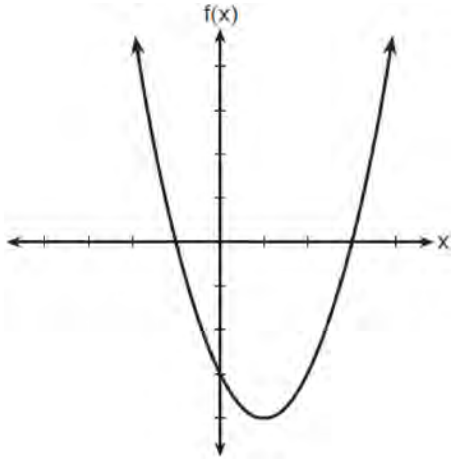
74 When factored completely, $-x^3 + 10x^2 + 24x$ is
1) $-x(x+4)(x-6)$
2) $-x(x-4)(x-6)$
3) $-x(x+2)(x-12)$
4) $-x(x-2)(x+12)$

75 The solution to $4p + 2 < 2(p + 5)$ is

76 The expression $(5x^2 - x + 4) - 3(x^2 - x - 2)$ is equivalent to

77 Which of the three situations given below is best modeled by an exponential function?
I. A bacteria culture doubles in size every day.
II. A plant grows by 1 inch every 4 days.
III. The population of a town declines by 5% every 3 years.

78 The function f is graphed on the set of axes below.



What is a possible factorization of this function?

79 During summer vacation, Ben decides to sell hot dogs and pretzels on a food cart in Manhattan. It costs Ben \$0.50 for each hot dog and \$0.40 for each pretzel. He has only \$100 to spend each day on hot dogs and pretzels. He wants to sell at least 200 items each day. If h is the number of hot dogs and p is the number of pretzels, which inequality would be part of a system of inequalities used to determine the total number of hot dogs and pretzels Ben can sell?

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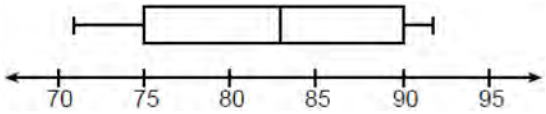
80 Given: $f(x) = (x-2)^2 + 4$

$g(x) = (x-5)^2 + 4$

When compared to the graph of $f(x)$, the graph of $g(x)$ is

81 Joe compared gas prices in England and New York State one day. In England, gas sold for 1.35 euros per liter, and one dollar equaled 0.622 euros. A correct way to figure out this cost, in dollars per gallon, is

82 The box plot below summarizes the data for the average monthly high temperatures in degrees Fahrenheit for Orlando, Florida.



The third quartile is

83 The solution to $3(x-8) + 4x = 8x + 4$ is

84 A movie theater's popcorn box is a rectangular prism with a base that measures 6 inches by 4 inches and has a height of 8 inches. To create a larger box, both the length and the width will be increased by x inches. The height will remain the same. Which function represents the volume, $V(x)$, of the larger box?

85 How many real-number solutions does $4x^2 + 2x + 5 = 0$ have?

86 What is the solution to $-3(x-6) > 2x - 2$?

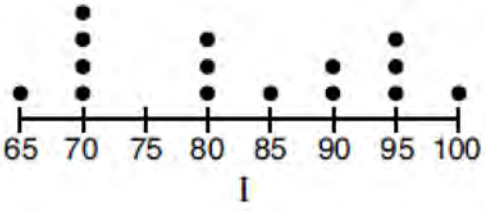
87 Which polynomial is twice the sum of $4x^2 - x + 1$ and $-6x^2 + x - 4$?

88 A function is defined as $K(x) = 2x^2 - 5x + 3$. The value of $K(-3)$ is

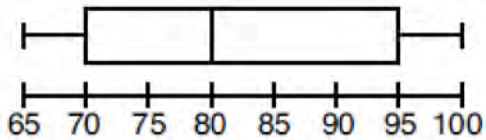
89 Given the following data set:

65, 70, 70, 70, 70, 80, 80, 80, 85, 90, 90, 95, 95, 95, 100

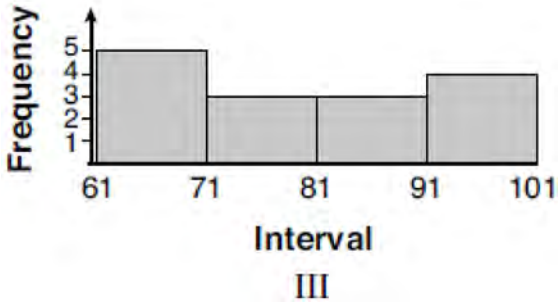
Which representations are correct for this data set?



I



II



III

90 The solution to $-2(1-4x) = 3x + 8$ is

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91 Thirty-two teams are participating in a basketball tournament. Only the winning teams in each round advance to the next round, as shown in the table below.

Number of Rounds Completed, x	0	1	2	3	4	5
Number of Teams Remaining, $f(x)$	32	16	8	4	2	1

Which function type best models the relationship between the number of rounds completed and the number of teams remaining?

92 One Saturday afternoon, three friends decided to keep track of the number of text messages they received each hour from 8 a.m. to noon. The results are shown below.
Emily said that the number of messages she received increased by 8 each hour.
Jessica said that the number of messages she received doubled every hour.
Chris said that he received 3 messages the first hour, 10 the second hour, none the third hour, and 15 the last hour.
Which of the friends' responses best classifies the number of messages they received each hour as a linear function?

93 The expression $-4.9t^2 + 50t + 2$ represents the height, in meters, of a toy rocket t seconds after launch. The initial height of the rocket, in meters, is

94 What is the solution to the inequality below?

$$4 - \frac{2}{5}x \geq \frac{1}{3}x + 15$$

95 The zeros of a polynomial function are –2, 4, and 0. What are all the factors of this function?
1) $(x+2)$ and $(x-4)$
2) $(x-2)$ and $(x+4)$
3) $x, (x+2)$, and $(x-4)$
4) $x, (x-2)$, and $(x+4)$

96 If point $(K, -5)$ lies on the line whose equation is $3x + y = 7$, then the value of K is

97 Ashley only has 7 quarters and some dimes in her purse. She needs at least $3.00 to pay for lunch. Which inequality could be used to determine the number of dimes, d, she needs in her purse to be able to pay for lunch?

98 What is the value of x in the equation $\frac{5(2x-4)}{3} + 9 = 14$?

99 Britney is solving a quadratic equation. Her first step is shown below.

Problem: $3x^2 - 8 - 10x = 3(2x + 3)$

Step 1: $3x^2 - 10x - 8 = 6x + 9$

Which two properties did Britney use to get to step 1?

I. addition property of equality
II. commutative property of addition
III. multiplication property of equality
IV. distributive property of multiplication over addition

100 The roots of $x^2 - 5x - 4 = 0$ are

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101 A survey was given to 12th-grade students of West High School to determine the location for the senior class trip. The results are shown in the table below.

	Niagara Falls	Darien Lake	New York City
Boys	56	74	103
Girls	71	92	88

To the *nearest percent*, what percent of the boys chose Niagara Falls?

102 Josh graphed the function $f(x) = -3(x-1)^2 + 2$. He then graphed the function $g(x) = -3(x-1)^2 - 5$ on the same coordinate plane. The vertex of $g(x)$ is

103 The function $f(x) = 2x^2 + 6x - 12$ has a domain consisting of the integers from –2 to 1, inclusive. Which set represents the corresponding range values for $f(x)$?

104 The expression $3(x^2 + 2x - 3) - 4(4x^2 - 7x + 5)$ is equivalent to

105 Materials *A* and *B* decay over time. The function for the amount of material *A* is $A(t) = 1000(0.5)^{2t}$ and for the amount of material *B* is $B(t) = 1000(0.25)^t$, where *t* represents time in days. On which day will the amounts of material be equal?

106 If the original function $f(x) = 2x^2 - 1$ is shifted to the left 3 units to make the function $g(x)$, which expression would represent $g(x)$?

107 In the process of solving the equation $10x^2 - 12x - 16x = 6$, George wrote $2(5x^2 - 14x) = 2(3)$, followed by $5x^2 - 14x = 3$. Which properties justify George's process?

A. addition property of equality
B. division property of equality
C. commutative property of addition
D. distributive property

108 A population of paramecia, *P*, can be modeled using the exponential function $P(t) = 3(2)^t$, where *t* is the number of days since the population was first observed. Which domain is most appropriate to use to determine the population over the course of the first two weeks?

109 What are the solutions to the equation $3(x-4)^2 = 27$?

110 A dolphin jumps out of the water and then back into the water. His jump could be graphed on a set of axes where *x* represents time and *y* represents distance above or below sea level. The domain for this graph is best represented using a set of

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111 The function f is shown in the table below.

x	f(x)
0	1
1	3
2	9
3	27

Which type of function best models the given data?

112 Sarah travels on her bicycle at a speed of 22.7 miles per hour. What is Sarah's approximate speed, in kilometers per minute?

113 What is the range of the function $f(x) = (x-4)^2 + 1$?
1) $x > 4$
2) $x \geq 4$
3) $f(x) > 1$
4) $f(x) \geq 1$

114 Joe deposits $4000 into a certificate of deposit (CD) at his local bank. The CD earns 3% interest, compounded annually. The value of the CD in x years can be found using the function
1) $f(x) = 4000 + 0.3x$
2) $f(x) = 4000 + 0.03x$
3) $f(x) = 4000(1.3)^x$
4) $f(x) = 4000(1.03)^x$

115 The solution to $2x^2 = 72$ is

116 The solutions to $(x+4)^2 - 2 = 7$ are

117 If the zeros of the function $g(x)$ are $\{-3, 0, 4\}$, which function could represent $g(x)$?

118 The 24th term of the sequence $-5, -11, -17, -23, \ldots$ is

119 If $f(x) = \frac{3x+4}{2}$, then $f(8)$ is

120 A swimmer set a world record in the women's 1500-meter freestyle, finishing the race in 15.42 minutes. If 1 meter is approximately 3.281 feet, which set of calculations could be used to convert her speed to miles per hour?

121 The height of a ball Doreen tossed into the air can be modeled by the function $h(x) = -4.9x^2 + 6x + 5$, where x is the time elapsed in seconds, and $h(x)$ is the height in meters. The number 5 in the function represents

122 The function $g(x)$ is defined as $g(x) = -2x^2 + 3x$. The value of $g(-3)$ is

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123 Three quadratic functions are given below.

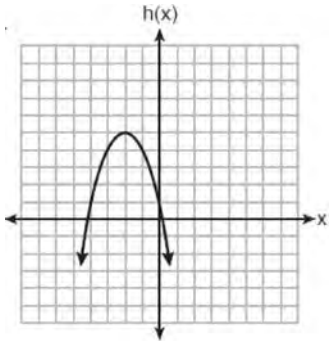
I.

$$f(x) = (x+2)^2 + 5$$

II.

x	–4	–3	–2	–1	0	1
g(x)	–3	2	5	5	2	–3

III.



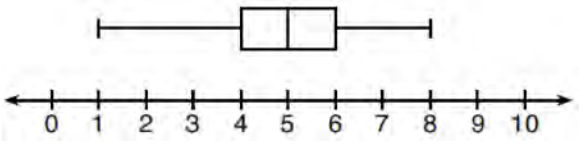
Which of these functions have the same vertex?

124 Each day, a local dog shelter spends an average of \$2.40 on food per dog. The manager estimates the shelter's daily expenses, assuming there is at least one dog in the shelter, using the function $E(x) = 30 + 2.40x$. Which statements regarding the function $E(x)$ are correct?

I. x represents the number of dogs at the shelter per day.
II. x represents the number of volunteers at the shelter per day.
III. 30 represents the shelter's total expenses per day.
IV. 30 represents the shelter's nonfood expenses per day.

125 Compared to the graph of $f(x) = x^2$, the graph of $g(x) = (x-2)^2 + 3$ is the result of translating $f(x)$

126 What is the range of the box plot shown below?



127 A grocery store sells packages of beef. The function $C(w)$ represents the cost, in dollars, of a package of beef weighing w pounds. The most appropriate domain for this function would be

128 The expression $(m-3)^2$ is equivalent to

Algebra I Regents Bimodal Worksheet # 13 Name: _____
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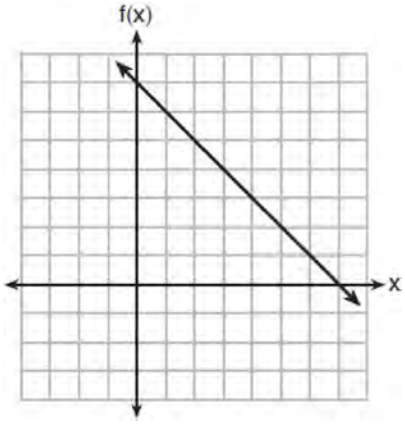
129 The functions $f(x)$, $q(x)$, and $p(x)$ are shown below.



$q(x) = (x-1)^2 - 6$

x	p(x)
2	5
3	4
4	3
5	4
6	5

When the input is 4, which functions have the same output value?

130 A laboratory technician used the function $t(m) = 2(3)^{2m+1}$ to model her research. Consider the following expressions:

I. $6(3)^{2m}$ II. $6(6)^{2m}$ III. $6(9)^{m}$

The function $t(m)$ is equivalent to

131 Peter has \$100 to spend on drinks for his party. Bottles of lemonade cost \$2 each, and juice boxes cost \$0.50 each. If x is the number of bottles of lemonade and y is the number of juice boxes, which inequality models this situation?

132 The expression $16x^2 - 81$ is equivalent to

133 Given $f(x) = -3x^2 + 10$, what is the value of $f(-2)$?

134 An outdoor club conducted a survey of its members. The members were asked to state their preference between skiing and snowboarding. Each member had to pick one. Of the 60 males, 45 stated they preferred to snowboard. Twenty-two of the 60 females preferred to ski. What is the relative frequency that a male prefers to ski?

135 The range of $f(x) = x^2 + 2x - 5$ is the set of all real numbers

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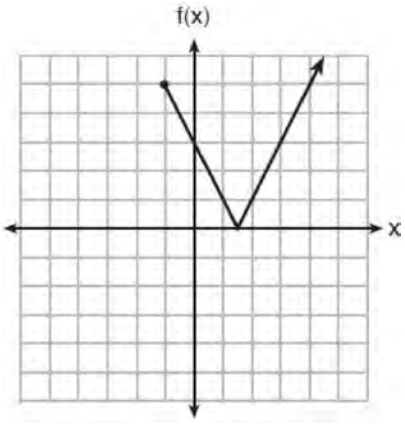
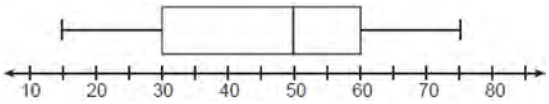
136 The function $f(x)$ is graphed below.



The domain of this function is

137 A box plot is shown below.



Which number represents the third quartile?

138 Which domain would be the most appropriate to use for a function that compares the number of emails sent (x) to the amount of data used for a cell phone plan (y)?

139 The formula for electrical power, P, is $P = I^2R$, where I is current and R is resistance. The formula for I in terms of P and R is

140 Sunny purchases a new car for $29,873. The car depreciates 20% annually. Which expression can be used to determine the value of the car after t years?

141 The Utica Boilermaker is a 15-kilometer road race. Sara is signed up to run this race and has done the following training runs:

I. 10 miles
II. 44,880 feet
III. 15,560 yards

Which run(s) are at least 15 kilometers?

142 The solution to $\frac{2}{3}(3-2x) = \frac{3}{4}$ is

1) $-\frac{11}{8}$
2) $\frac{5}{8}$
3) $-\frac{33}{16}$
4) $\frac{15}{16}$

143 Joy wants to buy strawberries and raspberries to bring to a party. Strawberries cost $1.60 per pound and raspberries cost $1.75 per pound. If she only has $10 to spend on berries, which inequality represents the situation where she buys x pounds of strawberries and y pounds of raspberries?

144 What is the degree of the polynomial $2x + x^3 + 5x^2$?

145 Three expressions are shown below.

I. $(x^3)^3$
II. $x^4 \bullet x^5$
III. $x^{10} \bullet x^{-1}$

Which expressions are equivalent for all positive values of x?

146 What is the constant term of the polynomial $4d + 6 + 3d^2$?

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147 Some adults were surveyed to find out if they would prefer to buy a sports utility vehicle (SUV) or a sports car. The results of the survey are summarized in the table below.

	SUV	Sports Car	Totals
Male	21	38	59
Female	135	46	181
Totals	156	84	240

Of the number of adults that preferred sports cars, approximately what percent were males?

148 A middle school conducted a survey of students to determine if they spent more of their time playing games or watching videos on their tablets. The results are shown in the table below.

	Playing Games	Watching Videos	Total
Boys	138	46	184
Girls	54	142	196
Total	192	188	380

Of the students who spent more time playing games on their tablets, approximately what percent were boys?

149 The length, width, and height of a rectangular box are represented by $2x$, $3x + 1$, and $5x - 6$, respectively. When the volume is expressed as a polynomial in standard form, what is the coefficient of the 2nd term?

150 The product of $(x^2 + 3x + 9)$ and $(x - 3)$ is

1) $x^3 - 27$
2) $x^2 + 4x + 6$
3) $x^3 - 6x^2 - 18x - 27$
4) $-6x^4 + x^3 - 18x^2 - 27$

151 A ball is thrown into the air from the top of a building. The height, $h(t)$, of the ball above the ground t seconds after it is thrown can be modeled by $h(t) = -16t^2 + 64t + 80$. How many seconds after being thrown will the ball hit the ground?

152 Lizzy has 30 coins that total \$4.80. All of her coins are dimes, D, and quarters, Q. Which system of equations models this situation?

153 When the temperature is 59°F, the speed of sound at sea level is 1225 kilometers per hour. Which process could be used to convert this speed into feet per second?

1) $\frac{1225\text{ km}}{1\text{ hr}} \bullet \frac{0.62\text{ mi}}{1\text{ km}} \bullet \frac{1\text{ hr}}{60\text{ min}} \bullet \frac{1\text{ mi}}{5280\text{ ft}} \bullet \frac{1\text{ min}}{60\text{ sec}}$
2) $\frac{1225\text{ km}}{1\text{ hr}} \bullet \frac{0.62\text{ mi}}{1\text{ km}} \bullet \frac{5280\text{ ft}}{1\text{ mi}} \bullet \frac{1\text{ hr}}{60\text{ min}} \bullet \frac{1\text{ min}}{60\text{ sec}}$
3) $\frac{1225\text{ km}}{1\text{ hr}} \bullet \frac{1\text{ km}}{0.62\text{ mi}} \bullet \frac{5280\text{ ft}}{1\text{ mi}} \bullet \frac{1\text{ hr}}{60\text{ min}} \bullet \frac{1\text{ min}}{60\text{ sec}}$
4) $\frac{1225\text{ km}}{1\text{ hr}} \bullet \frac{0.62\text{ mi}}{1\text{ km}} \bullet \frac{5280\text{ ft}}{1\text{ mi}} \bullet \frac{60\text{ min}}{1\text{ hr}} \bullet \frac{1\text{ min}}{60\text{ sec}}$

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154 Students were asked to name their favorite sport from a list of basketball, soccer, or tennis. The results are shown in the table below.

	Basketball	**Soccer**	**Tennis**
Girls	42	58	20
Boys	84	41	5

What percentage of the students chose soccer as their favorite sport?

155 Given the set $\{x \mid -2 \le x \le 2$, where x is an integer$\}$, what is the solution of $-2(x-5) < 10$?

156 If the domain of the function $f(x) = 2x^2 - 8$ is $\{-2, 3, 5\}$, then the range is

157 Emily was given \$600 for her high school graduation. She invested it in an account that earns 2.4% interest per year. If she does *not* make any deposits or withdrawals, which expression can be used to determine the amount of money that will be in the account after 4 years?

158 The following conversion was done correctly:

$$\frac{3 \text{ miles}}{1 \text{ hour}} \bullet \frac{1 \text{ hour}}{60 \text{ minutes}} \bullet \frac{5280 \text{ feet}}{1 \text{ mile}} \bullet \frac{12 \text{ inches}}{1 \text{ foot}}$$

What were the final units for this conversion?

159 Mrs. Allard asked her students to identify which of the polynomials below are in standard form and explain why.

I. $15x^4 - 6x + 3x^2 - 1$

II. $12x^3 + 8x + 4$

III. $2x^5 + 8x^2 + 10x$

Which student's response is correct?

160 Three expressions are written below.

A. $(2xy^2)^3$

B. $(2x)^3 y^6$

C. $(2x^2y^2)(4xy^3)$

Which expressions are equivalent to $8x^3y^6$?

1) *A* and *B*, only
2) *B* and *C*, only
3) *A* and *C*, only
4) *A*, *B*, and *C*

161 An ice cream shop sells ice cream cones, *c*, and milkshakes, *m*. Each ice cream cone costs \$1.50 and each milkshake costs \$2.00. Donna has \$19.00 to spend on ice cream cones and milkshakes. If she must buy 5 ice cream cones, which inequality could be used to determine the maximum number of milkshakes she can buy?

162 The length of a rectangular patio is 7 feet more than its width, *w*. The area of a patio, $A(w)$, can be represented by the function

163 What would be the order of these quadratic functions when they are arranged from the narrowest graph to the widest graph?

$$f(x) = -5x^2 \quad g(x) = 0.5x^2 \quad h(x) = 3x^2$$

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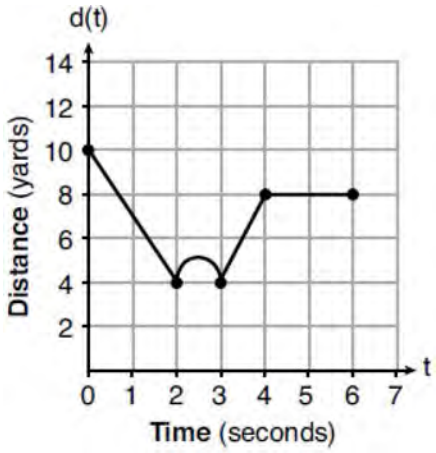
164 The quadratic functions $r(x)$ and $q(x)$ are given below.

x	$r(x)$
–4	–12
–3	–15
–2	–16
–1	–15
0	–12
1	7

$$q(x) = x^2 + 2x - 8$$

The function with the *smaller* minimum value is

165 A child is playing outside. The graph below shows the child's distance, $d(t)$, in yards from home over a period of time, t, in seconds.



Which interval represents the child constantly moving closer to home?

166 The expression $3(x + 4) - (2x + 7)$ is equivalent to

167 Nicci's sister is 7 years less than twice Nicci's age, a. The sum of Nicci's age and her sister's age is 41. Which equation represents this relationship?

168 If the parent function of $f(x)$ is $p(x) = x^2$, then the graph of the function $f(x) = (x - k)^2 + 5$, where $k > 0$, would be a shift of

169 If $f(x) = 4x + 5$, what is the value of $f(-3)$?

170 What is the solution to the inequality $2x - 7 > 2.5x + 3$?

1) $x > -5$
2) $x < -5$
3) $x > -20$
4) $x < -20$

171 The function $G(m)$ represents the amount of gasoline consumed by a car traveling m miles. An appropriate domain for this function would be

172 The formula for the area of a trapezoid is $A = \frac{1}{2}(b_1 + b_2)h$. The height, h, of the trapezoid may be expressed as

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173 Last weekend, Emma sold lemonade at a yard sale. The function $P(c) = .50c - 9.96$ represented the profit, $P(c)$, Emma earned selling c cups of lemonade. Sales were strong, so she raised the price for this weekend by 25 cents per cup. Which function represents her profit for this weekend?

174 Which equation is equivalent to $y = x^2 + 24x - 18$?

175 Which expression is equivalent to $2(x^2 - 1) + 3x(x - 4)$?

176 The function $f(x) = |x|$ is multiplied by k to create the new function $g(x) = k|x|$. Which statement is true about the graphs of $f(x)$ and $g(x)$ if $k = \frac{1}{2}$?

177 The formula $Ax + By = C$ represents the equation of a line in standard form. Which expression represents y in terms of A, B, C, and x?

178 If $g(x) = -x^2 - x + 5$, then $g(-4)$ is equal to

179 When written in factored form, $4w^2 - 11w - 3$ is equivalent to

180 When written in standard form, the product of $(3 + x)$ and $(2x - 5)$ is

181 What is the product of $(2x + 7)$ and $(x - 3)$?

182 When $3x^2 + 7x - 6 + 2x^3$ is written in standard form, the leading coefficient is

183 Given the following three sequences:

I. $2, 4, 6, 8, 10\ldots$

II. $2, 4, 8, 16, 32\ldots$

III. $a, a + 2, a + 4, a + 6, a + 8\ldots$

Which ones are arithmetic sequences?

184 Which expression is equivalent to $(-4x^2)^3$?

185 Eric deposits $500 in a bank account that pays 3.5% interest, compounded yearly. Which type of function should he use to determine how much money he will have in the account at the end of 10 years?

186 The amount Mike gets paid weekly can be represented by the expression $2.50a + 290$, where a is the number of cell phone accessories he sells that week. What is the constant term in this expression and what does it represent?

187 If $f(x) = 2x + 6$ and $g(x) = |x|$ are graphed on the same coordinate plane, for which value of x is $f(x) = g(x)$?

1) 6
2) 2
3) –2
4) –6

188 On the main floor of the Kodak Hall at the Eastman Theater, the number of seats per row increases at a constant rate. Steven counts 31 seats in row 3 and 37 seats in row 6. How many seats are there in row 20?

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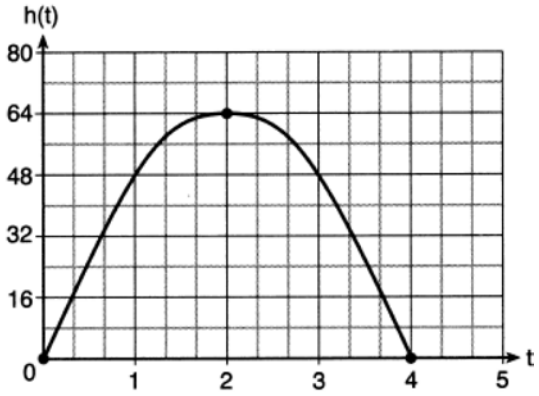
189 The line represented by the equation $4y + 2x = 33.6$ shares a solution point with the line represented by the table below.

x	y
–5	3.2
–2	3.8
2	4.6
4	5
11	6.4

The solution for this system is

190 Jim uses the equation $A = P(1 + 0.05)^t$ to find the amount of money in an account, *A*, of an investment, *P*, after *t* years. For this equation, which phrase describes the yearly rate of change?

191 The diagram below shows the graph of $h(t)$, which models the height, in feet, of a rocket *t* seconds after it was shot into the air.

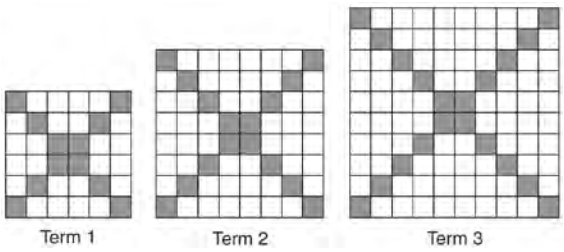


The domain of $h(t)$ is

192 What is the sum of $3x\sqrt{7}$ and $2x\sqrt{7}$?

193 Morgan read that a snail moves about 72 feet per day. He performs the calculation $\frac{72 \text{ feet}}{1 \text{ day}} \bullet \frac{1 \text{ day}}{24 \text{ hours}} \bullet \frac{1 \text{ hour}}{60 \text{ minutes}} \bullet \frac{12 \text{ inches}}{1 \text{ foot}}$ to convert this rate to different units. What are the units for the converted rate?

194 The diagrams below represent the first three terms of a sequence.



Assuming the pattern continues, which formula determines a_n, the number of shaded squares in the *n*th term?

195 Faith wants to use the formula $C(f) = \frac{5}{9}(f - 32)$ to convert degrees Fahrenheit, *f*, to degrees Celsius, $C(f)$. If Faith calculated $C(68)$, what would her result be?

Algebra I Regents Bimodal Worksheets

196 The table below shows the average yearly balance in a savings account where interest is compounded annually. No money is deposited or withdrawn after the initial amount is deposited.

Year	Balance, in Dollars
0	380.00
10	562.49
20	832.63
30	1232.49
40	1824.39
50	2700.54

Which type of function best models the given data?

197 The table below represents the function F.

x	3	4	6	7	8
$F(x)$	9	17	65	129	257

The equation that represents this function is

198 A typical cell phone plan has a fixed base fee that includes a certain amount of data and an overage charge for data use beyond the plan. A cell phone plan charges a base fee of \$62 and an overage charge of \$30 per gigabyte of data that exceed 2 gigabytes. If C represents the cost and g represents the total number of gigabytes of data, which equation could represent this plan when more than 2 gigabytes are used?

199 If a population of 100 cells triples every hour, which function represents $p(t)$, the population after t hours?

200 The zeros of the function $f(x) = 3x^2 - 3x - 6$ are

201 Connor wants to attend the town carnival. The price of admission to the carnival is \$4.50, and each ride costs an additional 79 cents. If he can spend at most \$16.00 at the carnival, which inequality can be used to solve for r, the number of rides Connor can go on, and what is the maximum number of rides he can go on?

202 The point $(3, w)$ is on the graph of $y = 2x + 7$. What is the value of w?

203 When $3x + 2 \leq 5(x - 4)$ is solved for x, the solution is

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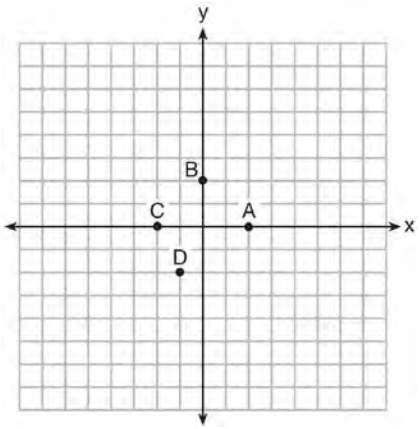
204 The graph of $y = f(x)$ is shown below.



Which point could be used to find $f(2)$?

205 A cell phone company charges \$60.00 a month for up to 1 gigabyte of data. The cost of additional data is \$0.05 per megabyte. If d represents the number of additional megabytes used and c represents the total charges at the end of the month, which linear equation can be used to determine a user's monthly bill?

206 What are the solutions to the equation $x^2 - 8x = 24$?

207 What is the largest integer, x, for which the value of $f(x) = 5x^4 + 30x^2 + 9$ will be greater than the value of $g(x) = 3^x$?

208 Sara was asked to solve this word problem: "The product of two consecutive integers is 156. What are the integers?" What type of equation should she create to solve this problem?

209 What are the zeros of the function $f(x) = x^2 - 13x - 30$?

210 Keith determines the zeros of the function $f(x)$ to be -6 and 5. What could be Keith's function?

211 If $A = 3x^2 + 5x - 6$ and $B = -2x^2 - 6x + 7$, then $A - B$ equals

212 Which expression is equivalent to $2(3g - 4) - (8g + 3)$?

213 Mo's farm stand sold a total of 165 pounds of apples and peaches. She sold apples for \$1.75 per pound and peaches for \$2.50 per pound. If she made \$337.50, how many pounds of peaches did she sell?

214 An astronaut drops a rock off the edge of a cliff on the Moon. The distance, $d(t)$, in meters, the rock travels after t seconds can be modeled by the function $d(t) = 0.8t^2$. What is the average speed, in meters per second, of the rock between 5 and 10 seconds after it was dropped?

215 Miriam and Jessica are growing bacteria in a laboratory. Miriam uses the growth function $f(t) = n^{2t}$ while Jessica uses the function $g(t) = n^{4t}$, where n represents the initial number of bacteria and t is the time, in hours. If Miriam starts with 16 bacteria, how many bacteria should Jessica start with to achieve the same growth over time?

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216 Four expressions are shown below.

I $2(2x^2 - 2x - 60)$
II $4(x^2 - x - 30)$
III $4(x + 6)(x - 5)$
IV $4x(x - 1) - 120$

The expression $4x^2 - 4x - 120$ is equivalent to

217 Milton has his money invested in a stock portfolio. The value, $v(x)$, of his portfolio can be modeled with the function $v(x) = 30,000(0.78)^x$, where x is the number of years since he made his investment. Which statement describes the rate of change of the value of his portfolio?

218 The equation $A = 1300(1.02)^7$ is being used to calculate the amount of money in a savings account. What does 1.02 represent in this equation?

219 Given the graph of the line represented by the equation $f(x) = -2x + b$, if b is increased by 4 units, the graph of the new line would be shifted 4 units

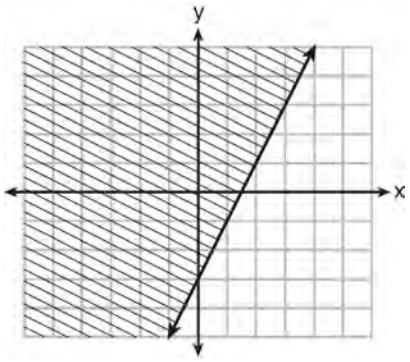
220 The owner of a small computer repair business has one employee, who is paid an hourly rate of $22. The owner estimates his weekly profit using the function $P(x) = 8600 - 22x$. In this function, x represents the number of

221 Which expression is equivalent to $36x^2 - 100$?

222 What is the *minimum* value of the function $y = |x + 3| - 2$?

223 The inequality $7 - \frac{2}{3}x < x - 8$ is equivalent to

224 Which inequality is represented by the graph below?



225 The expression $3(x^2 - 1) - (x^2 - 7x + 10)$ is equivalent to

226 A part of Jennifer's work to solve the equation $2(6x^2 - 3) = 11x^2 - x$ is shown below.

Given: $2(6x^2 - 3) = 11x^2 - x$
Step 1: $12x^2 - 6 = 11x^2 - x$

Which property justifies her first step?

227 For a recently released movie, the function $y = 119.67(0.61)^x$ models the revenue earned, y, in millions of dollars each week, x, for several weeks after its release. Based on the equation, how much more money, in millions of dollars, was earned in revenue for week 3 than for week 5?

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228 The equation for the volume of a cylinder is $V = \pi r^2 h$. The positive value of *r*, in terms of *h* and *V*, is

229 Michael borrows money from his uncle, who is charging him simple interest using the formula $I = Prt$. To figure out what the interest rate, *r*, is, Michael rearranges the formula to find *r*. His new formula is *r* equals

230 Last week, a candle store received \$355.60 for selling 20 candles. Small candles sell for \$10.98 and large candles sell for \$27.98. How many large candles did the store sell?

231 The value in dollars, $v(x)$, of a certain car after *x* years is represented by the equation $v(x) = 25,000(0.86)^x$. To the *nearest dollar*, how much more is the car worth after 2 years than after 3 years?

232 The expression $9m^2 - 100$ is equivalent to

233 If Lylah completes the square for $f(x) = x^2 - 12x + 7$ in order to find the minimum, she must write $f(x)$ in the general form $f(x) = (x - a)^2 + b$. What is the value of *a* for $f(x)$?

234 Which value of *x* is a solution to the equation $13 - 36x^2 = -12$?

235 Gretchen has \$50 that she can spend at the fair. Ride tickets cost \$1.25 each and game tickets cost \$2 each. She wants to go on a minimum of 10 rides and play at least 12 games. Which system of inequalities represents this situation when *r* is the number of ride tickets purchased and *g* is the number of game tickets purchased?

236 Given the functions $h(x) = \frac{1}{2}x + 3$ and $j(x) = |x|$, which value of *x* makes $h(x) = j(x)$?

237 How does the graph of $f(x) = 3(x - 2)^2 + 1$ compare to the graph of $g(x) = x^2$?

238 The range of the function defined as $y = 5^x$ is

239 Which polynomial function has zeros at –3, 0, and 4?

240 Which value of *x* results in equal outputs for $j(x) = 3x - 2$ and $b(x) = |x + 2|$?

241 If $f(x) = x^2$, which function is the result of shifting $f(x)$ 3 units left and 2 units down?

1) $g(x) = (x + 2)^2 - 3$
2) $g(x) = (x - 2)^2 + 3$
3) $g(x) = (x + 3)^2 - 2$
4) $g(x) = (x - 3)^2 + 2$

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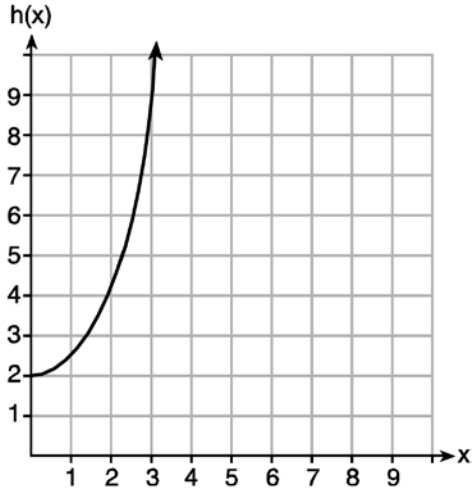
242 Given the functions g(x), f(x), and h(x) shown below:

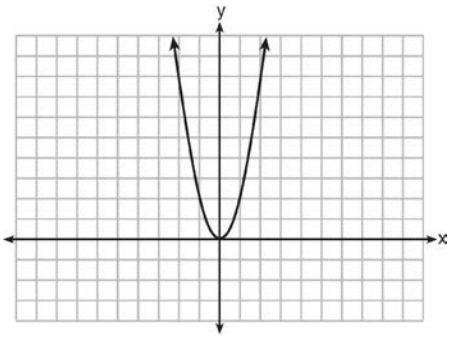
$$g(x) = x^2 - 2x$$

x	f(x)
0	1
1	2
2	5
3	7



The correct list of functions ordered from greatest to least by average rate of change over the interval $0 \le x \le 3$ is

243 The graph of the equation $y = ax^2$ is shown below.



If a is multiplied by $-\frac{1}{2}$, the graph of the new equation is

244 An equation is given below.

$$4(x - 7) = 0.3(x + 2) + 2.11$$

The solution to the equation is

245 Which domain would be the most appropriate set to use for a function that predicts the number of household online-devices in terms of the number of people in the household?

246 John has four more nickels than dimes in his pocket, for a total of $1.25. Which equation could be used to determine the number of dimes, x, in his pocket?

Algebra I Regents Bimodal Worksheet # 25 Name: _____
www.jmap.org

247 The tables below show the values of four different functions for given values of x.

x	f(x)
1	12
2	19
3	26
4	33

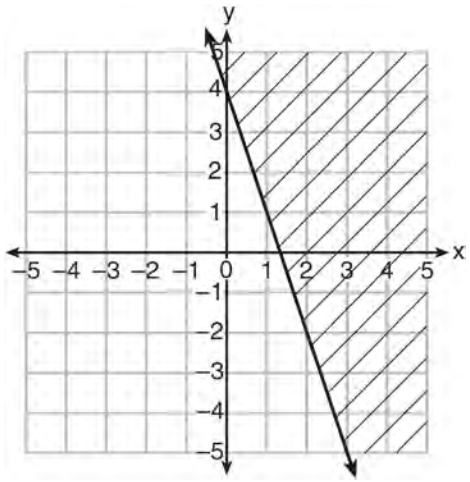
x	g(x)
1	–1
2	1
3	5
4	13

x	h(x)
1	9
2	12
3	17
4	24

x	k(x)
1	–2
2	4
3	14
4	28

Which table represents a linear function?·

248 Which inequality is represented in the graph below?



249 In the function $f(x) = (x-2)^2 + 4$, the minimum value occurs when x is

250 Abigail's and Gina's ages are consecutive integers. Abigail is younger than Gina and Gina's age is represented by x. If the difference of the square of Gina's age and eight times Abigail's age is 17, which equation could be used to find Gina's age?

251 Andy has $310 in his account. Each week, w, he withdraws $30 for his expenses. Which expression could be used if he wanted to find out how much money he had left after 8 weeks?

252 The distance a free falling object has traveled can be modeled by the equation $d = \frac{1}{2}at^2$, where a is acceleration due to gravity and t is the amount of time the object has fallen. What is t in terms of a and d?

253 Joe has a rectangular patio that measures 10 feet by 12 feet. He wants to increase the area by 50% and plans to increase each dimension by equal lengths, x. Which equation could be used to determine x?

254 The zeros of the function $f(x) = x^2 - 5x - 6$ are

255 What is the solution to the system of equations below?

$$y = 2x + 8$$
$$3(-2x + y) = 12$$

256 What are the roots of the equation $x^2 + 4x - 16 = 0$?

Algebra I Regents Bimodal Worksheet # 26 Name: _____
www.jmap.org

257 A public opinion poll was taken to explore the relationship between age and support for a candidate in an election. The results of the poll are summarized in the table below.

Age	For	Against	No Opinion
21-40	30	12	8
41-60	20	40	15
Over 60	25	35	15

What percent of the 21-40 age group was for the candidate?

258 The table below shows the number of grams of carbohydrates, x, and the number of Calories, y, of six different foods.

Carbohydrates (x)	**Calories** (y)
8	120
9.5	138
10	147
6	88
7	108
4	62

Which equation best represents the line of best fit for this set of data?

259 What is the value of x in the equation $\frac{x-2}{3}+\frac{1}{6}=\frac{5}{6}$?

260 The function $V(t) = 1350(1.017)^t$ represents the value $V(t)$, in dollars, of a comic book t years after its purchase. The yearly rate of appreciation of the comic book is

261 What is the domain of the relation shown below?

$$\{(4,2),(1,1),(0,0),(1,-1),(4,-2)\}$$

262 Dan took 12.5 seconds to run the 100-meter dash. He calculated the time to be approximately

263 An online company lets you download songs for \$0.99 each after you have paid a \$5 membership fee. Which domain would be most appropriate to calculate the cost to download songs?

264 A plumber has a set fee for a house call and charges by the hour for repairs. The total cost of her services can be modeled by $c(t) = 125t + 95$. Which statements about this function are true?

I. A house call fee costs \$95.
II. The plumber charges \$125 per hour.
III. The number of hours the job takes is represented by t.

Algebra I Regents Bimodal Worksheet # 27 Name: _____
www.jmap.org

265 What is the solution set of the equation $(x-2)(x-a)=0$?

266 During the 2010 season, football player McGee's earnings, *m*, were 0.005 million dollars more than those of his teammate Fitzpatrick's earnings, *f*. The two players earned a total of 3.95 million dollars. Which system of equations could be used to determine the amount each player earned, in millions of dollars?

267 Fred is given a rectangular piece of paper. If the length of Fred's piece of paper is represented by $2x-6$ and the width is represented by $3x-5$, then the paper has a total area represented by

268 Two texting plans are advertised. Plan *A* has a monthly fee of \$15 with a charge of \$0.08 per text. Plan *B* has a monthly fee of \$3 with a charge of \$0.12 per text. If *t* represents the number of text messages in a month, which inequality should be used to show that the cost of Plan *A* is *less* than the cost of Plan *B*?

1) $15+0.08t<3+0.12t$
2) $15+0.08t>3+0.12t$
3) $15t+0.08<3t+0.12$
4) $15t+0.08>3t+0.12$

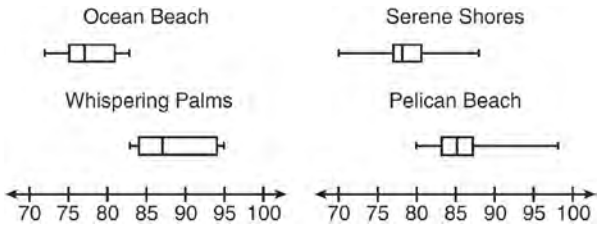
269 The daily cost of production in a factory is calculated using $c(x)=200+16x$, where *x* is the number of complete products manufactured. Which set of numbers best defines the domain of $c(x)$?

270 What is the solution to the inequality $2+\frac{4}{9}x\geq 4+x$?

271 Alicia has invented a new app for smart phones that two companies are interested in purchasing for a 2-year contract. Company *A* is offering her \$10,000 for the first month and will increase the amount each month by \$5000. Company *B* is offering \$500 for the first month and will double their payment each month from the previous month. Monthly payments are made at the end of each month. For which monthly payment will company *B*'s payment first exceed company *A*'s payment?

272 Konnor wants to burn 250 Calories while exercising for 45 minutes at the gym. On the treadmill, he can burn 6 Cal/min. On the stationary bike, he can burn 5 Cal/min. If *t* represents the number of minutes on the treadmill and *b* represents the number of minutes on the stationary bike, which expression represents the number of Calories that Konnor can burn on the stationary bike?

273 Corinne is planning a beach vacation in July and is analyzing the daily high temperatures for her potential destination. She would like to choose a destination with a high median temperature and a small interquartile range. She constructed box plots shown in the diagram below.



Which destination has a median temperature above 80 degrees and the smallest interquartile range?

274 What are the solutions to the equation $x^2-8x=10$?

Algebra I Regents Bimodal Worksheet # 28 Name: _____
www.jmap.org

275 Which trinomial is equivalent to $3(x-2)^2 - 2(x-1)$?

276 The zeros of the function $f(x) = (x+2)^2 - 25$ are

277 The volume of a trapezoidal prism can be found using the formula $V = \frac{1}{2}a(b+c)h$. Which equation is correctly solved for b?

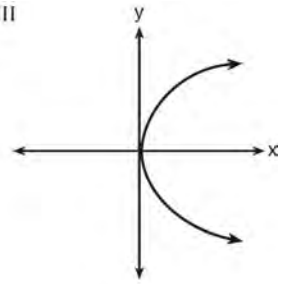
278 Lynn, Jude, and Anne were given the function $f(x) = -2x^2 + 32$, and they were asked to find $f(3)$. Lynn's answer was 14, Jude's answer was 4, and Anne's answer was ±4. Who is correct?

279 Which representations are functions?

I

x	y
2	6
3	−12
4	7
5	5
2	−6

III



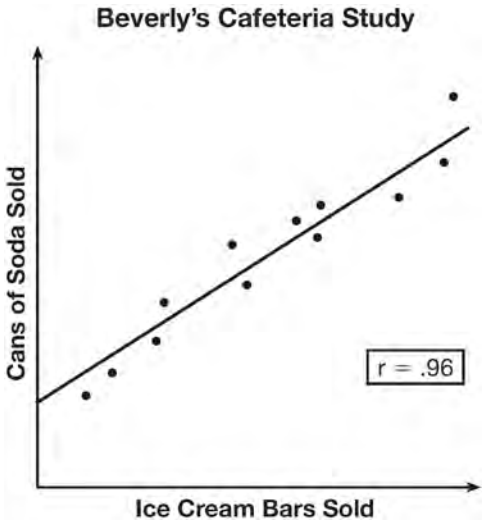
II $\{(1,1), (2,1), (3,2), (4,3), (5,5), (6,8), (7,13)\}$

IV $y = 2x + 1$

280 If $4x^2 - 100 = 0$, the roots of the equation are

281 A car leaves Albany, NY, and travels west toward Buffalo, NY. The equation $D = 280 - 59t$ can be used to represent the distance, D, from Buffalo after t hours. In this equation, the 59 represents the

282 Beverly did a study this past spring using data she collected from a cafeteria. She recorded data weekly for ice cream sales and soda sales. Beverly found the line of best fit and the correlation coefficient, as shown in the diagram below.



Given this information, which statement(s) can correctly be concluded?
I. Eating more ice cream causes a person to become thirsty.
II. Drinking more soda causes a person to become hungry.
III. There is a strong correlation between ice cream sales and soda sales.

283 Which value of x satisfies the equation $\frac{5}{6}\left(\frac{3}{8} - x\right) = 16$?

284 Given the following expressions:

I. $-\frac{5}{8} + \frac{3}{5}$ III. $\left(\sqrt{5}\right) \cdot \left(\sqrt{5}\right)$

II. $\frac{1}{2} + \sqrt{2}$ IV. $3 \cdot \left(\sqrt{49}\right)$

Which expression(s) result in an irrational number?

Algebra I Regents Bimodal Worksheet # 29 Name: _____
www.jmap.org

285 The table below shows the temperature, $T(m)$, of a cup of hot chocolate that is allowed to chill over several minutes, m.

Time, m (minutes)	0	2	4	6	8
Temperature, T(m) (°F)	150	108	78	56	41

Which expression best fits the data for $T(m)$?

286 Joey enlarged a 3-inch by 5-inch photograph on a copy machine. He enlarged it four times. The table below shows the area of the photograph after each enlargement.

Enlargement	0	1	2	3	4
Area (square inches)	15	18.8	23.4	29.3	36.6

What is the average rate of change of the area from the original photograph to the fourth enlargement, to the *nearest tenth*?

287 A parking garage charges a base rate of \$3.50 for up to 2 hours, and an hourly rate for each additional hour. The sign below gives the prices for up to 5 hours of parking.

Parking Rates	
2 hours	\$3.50
3 hours	\$9.00
4 hours	\$14.50
5 hours	\$20.00

Which linear equation can be used to find x, the additional hourly parking rate?

288 When the function $f(x) = x^2$ is multiplied by the value a, where $a > 1$, the graph of the new function, $g(x) = ax^2$

289 The value of the x-intercept for the graph of $4x - 5y = 40$ is

290 The range of the function $f(x) = x^2 + 2x - 8$ is all real numbers

291 A company that manufactures radios first pays a start-up cost, and then spends a certain amount of money to manufacture each radio. If the cost of manufacturing r radios is given by the function $c(r) = 5.25r + 125$, then the value 5.25 best represents

Algebra I Regents Bimodal Worksheet # 30 Name: _____
www.jmap.org

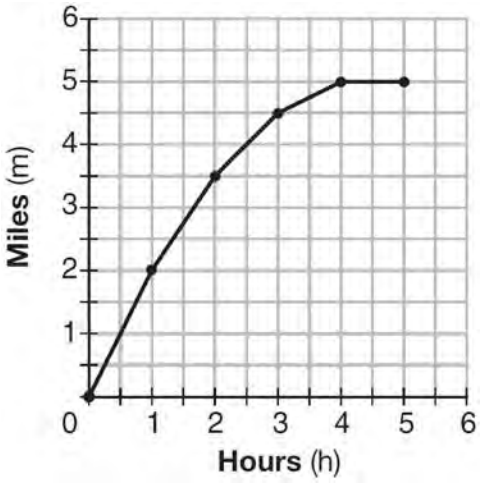
292 Mrs. Smith's math class surveyed students to determine their favorite flavors of soft ice cream. The results are shown in the table below.

	Chocolate	Vanilla	Twist
Juniors	42	27	45
Seniors	67	42	21

Of the students who preferred chocolate, approximately what percentage were seniors?

1) 27.5
2) 44.7
3) 51.5
4) 61.5

293 The graph below shows the distance in miles, *m*, hiked from a camp in *h* hours.



Which hourly interval had the greatest rate of change?

294 What is the solution to $2h + 8 > 3h - 6$?

295 Krystal was given $3000 when she turned 2 years old. Her parents invested it at a 2% interest rate compounded annually. No deposits or withdrawals were made. Which expression can be used to determine how much money Krystal had in the account when she turned 18?

296 A store sells self-serve frozen yogurt sundaes. The function $C(w)$ represents the cost, in dollars, of a sundae weighing w ounces. An appropriate domain for the function would be

297 A construction worker needs to move 120 ft^3 of dirt by using a wheelbarrow. One wheelbarrow load holds 8 ft^3 of dirt and each load takes him 10 minutes to complete. One correct way to figure out the number of hours he would need to complete this job is

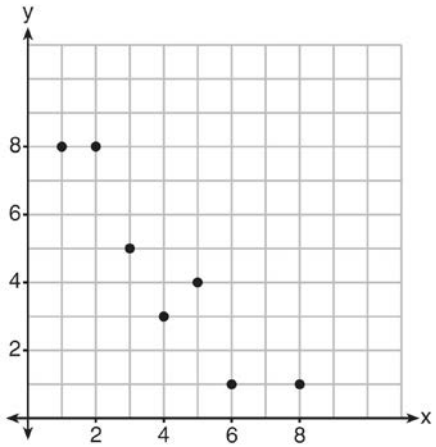
298 When factored completely, the expression $p^4 - 81$ is equivalent to

299 The highest possible grade for a book report is 100. The teacher deducts 10 points for each day the report is late. Which kind of function describes this situation?

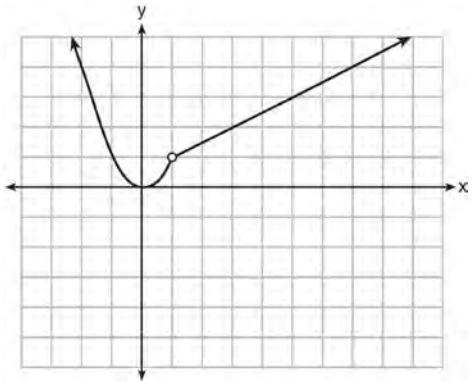
300 The length of the shortest side of a right triangle is 8 inches. The lengths of the other two sides are represented by consecutive odd integers. Which equation could be used to find the lengths of the other sides of the triangle?

Algebra I Regents Bimodal Worksheet # 31 Name: _____
www.jmap.org

301 What is the correlation coefficient of the linear fit of the data shown below, to the *nearest hundredth*?



302 A function is graphed on the set of axes below.

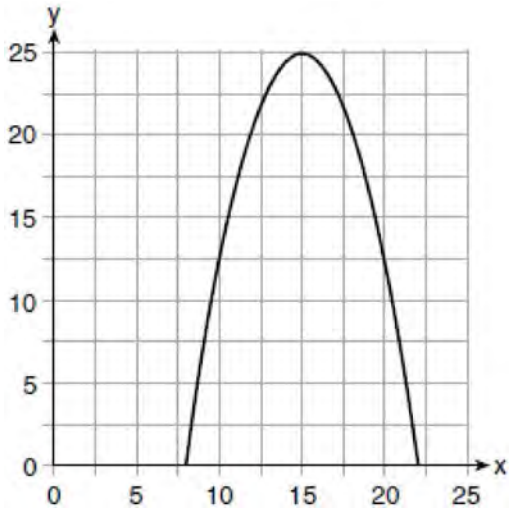


Which function is related to the graph?

303 Let f be a function such that $f(x) = 2x - 4$ is defined on the domain $2 \le x \le 6$. The range of this function is

304 If $f(x) = \frac{1}{2}x^2 - \left(\frac{1}{4}x + 3\right)$, what is the value of $f(8)$?

305 The graph of a quadratic function is shown below.



An equation that represents the function could be

306 The Celluloid Cinema sold 150 tickets to a movie. Some of these were child tickets and the rest were adult tickets. A child ticket cost $7.75 and an adult ticket cost $10.25. If the cinema sold $1470 worth of tickets, which system of equations could be used to determine how many adult tickets, *a*, and how many child tickets, *c*, were sold?

307 A construction company uses the function $f(p)$, where p is the number of people working on a project, to model the amount of money it spends to complete a project. A reasonable domain for this function would be

308 The solution of the equation $(x+3)^2 = 7$ is

309 The formula for the volume of a cone is $V = \frac{1}{3}\pi r^2 h$. The radius, *r*, of the cone may be expressed as

Algebra I Regents Bimodal Worksheet # 32 Name: _____
www.jmap.org

310 Peyton is a sprinter who can run the 40-yard dash in 4.5 seconds. He converts his speed into miles per hour, as shown below.

$$\frac{40\text{ yd}}{4.5\text{ sec}} \cdot \frac{3\text{ ft}}{1\text{ yd}} \cdot \frac{5280\text{ ft}}{1\text{ mi}} \cdot \frac{60\text{ sec}}{1\text{ min}} \cdot \frac{60\text{ min}}{1\text{ hr}}$$

Which ratio is *incorrectly* written to convert his speed?

311 It takes Tim 4.5 hours to run 50 kilometers. Which expression will allow him to change this rate to minutes per mile?

312 When solving the equation $4(3x^2 + 2) - 9 = 8x^2 + 7$, Emily wrote $4(3x^2 + 2) = 8x^2 + 16$ as her first step. Which property justifies Emily's first step?

313 What is a common ratio of the geometric sequence whose first term is 5 and third term is 245?

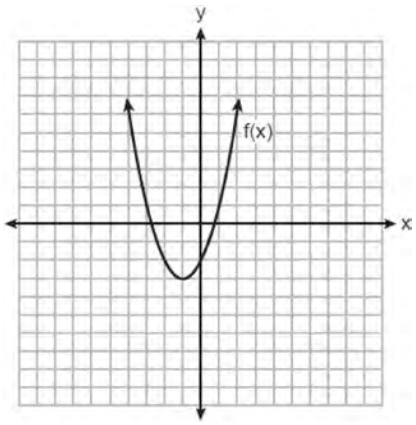
314 Anne invested $1000 in an account with a 1.3% annual interest rate. She made no deposits or withdrawals on the account for 2 years. If interest was compounded annually, which equation represents the balance in the account after the 2 years?

315 The formula for the surface area of a right rectangular prism is $A = 2lw + 2hw + 2lh$, where l, w, and h represent the length, width, and height, respectively. Which term of this formula is *not* dependent on the height?

316 If $f(x) = \dfrac{\sqrt{2x+3}}{6x-5}$, then $f\left(\dfrac{1}{2}\right) =$

317 The cost of a pack of chewing gum in a vending machine is $0.75. The cost of a bottle of juice in the same machine is $1.25. Julia has $22.00 to spend on chewing gum and bottles of juice for her team and she must buy seven packs of chewing gum. If b represents the number of bottles of juice, which inequality represents the maximum number of bottles she can buy?

318 The function $f(x)$ is graphed on the set of axes below.



What is the equation of the axis of symmetry for $f(x)$?

1) $x = -1$
2) $x = -3$
3) $y = -1$
4) $y = -3$

319 A company produces x units of a product per month, where $C(x)$ represents the total cost and $R(x)$ represents the total revenue for the month. The functions are modeled by $C(x) = 300x + 250$ and $R(x) = -0.5x^2 + 800x - 100$. The profit is the difference between revenue and cost where $P(x) = R(x) - C(x)$. What is the total profit, $P(x)$, for the month?

Algebra I Regents Bimodal Worksheet # 33 Name: _____
www.jmap.org

320 A radio station did a survey to determine what kind of music to play by taking a sample of middle school, high school, and college students. They were asked which of three different types of music they prefer on the radio: hip-hop, alternative, or classic rock. The results are summarized in the table below.

	Hip-Hop	**Alternative**	**Classic Rock**
Middle School	28	18	4
High School	22	22	6
College	16	20	14

What percentage of college students prefer classic rock?

321 The expression $49x^2 - 36$ is equivalent to

322 What is the degree of the polynomial $5x - 3x^2 - 1 + 7x^3$?
1) 1
2) 2
3) 3
4) 5

323 A satellite television company charges a one-time installation fee and a monthly service charge. The total cost is modeled by the function $y = 40 + 90x$. Which statement represents the meaning of each part of the function?

324 Kendal bought *x* boxes of cookies to bring to a party. Each box contains 12 cookies. She decides to keep two boxes for herself. She brings 60 cookies to the party. Which equation can be used to find the number of boxes, *x*, Kendal bought?

325 Morgan throws a ball up into the air. The height of the ball above the ground, in feet, is modeled by the function $h(t) = -16t^2 + 24t$, where *t* represents the time, in seconds, since the ball was thrown. What is the appropriate domain for this situation?

326 Jordan works for a landscape company during his summer vacation. He is paid \$12 per hour for mowing lawns and \$14 per hour for planting gardens. He can work a maximum of 40 hours per week, and would like to earn at least \$250 this week. If *m* represents the number of hours mowing lawns and *g* represents the number of hours planting gardens, which system of inequalities could be used to represent the given conditions?

327 The range of the function $f(x) = |x + 3| - 5$ is

328 The eleventh term of the sequence $3, -6, 12, -24, \ldots$, is
1) –3072
2) –6144
3) 3072
4) 6144

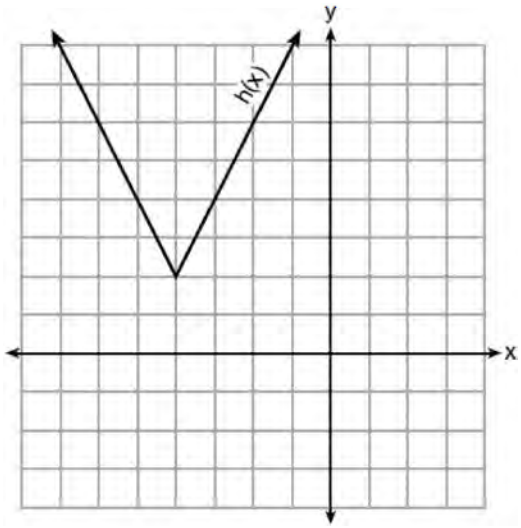
329 A student is asked to solve the equation $4(3x - 1)^2 - 17 = 83$. The student's solution to the problem starts as $4(3x - 1)^2 = 100$

$$(3x - 1)^2 = 25$$

A correct next step in the solution of the problem is

Algebra I Regents Bimodal Worksheet # 34 Name: _____
www.jmap.org

330 The function $h(x)$, which is graphed below, and the function $g(x) = 2|x + 4| - 3$ are given.



Which statements about these functions are true?
I. $g(x)$ has a lower minimum value than $h(x)$.
II. For all values of x, $h(x) < g(x)$.
III. For any value of x, $g(x) \neq h(x)$.

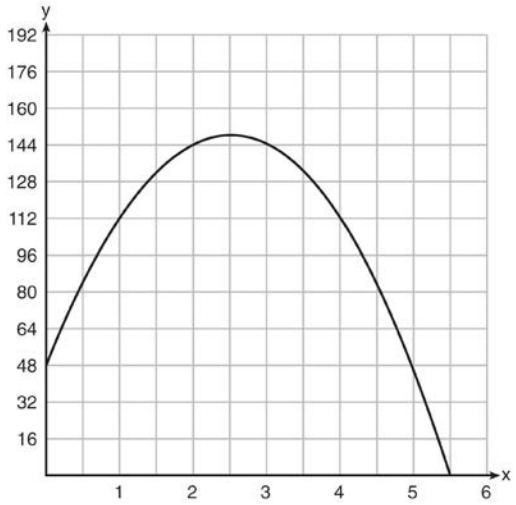
331 The expression $(-x^2 + 3x - 7) - (4x^2 + 5x - 2)$ is equivalent to
1) $-5x^2 - 2x - 9$
2) $-5x^2 - 2x - 5$
3) $-5x^2 + 8x - 9$
4) $-5x^2 + 8x - 5$

332 Which expression is equivalent to $16x^2 - 36$?

333 Sam and Jeremy have ages that are consecutive odd integers. The product of their ages is 783. Which equation could be used to find Jeremy's age, j, if he is the younger man?

334 For which function defined by a polynomial are the zeros of the polynomial –4 and –6?

335 A ball is thrown into the air from the edge of a 48-foot-high cliff so that it eventually lands on the ground. The graph below shows the height, y, of the ball from the ground after x seconds.



For which interval is the ball's height always *decreasing*?

336 Which value of x satisfies the equation $\frac{7}{3}\left(x + \frac{9}{28}\right) = 20$?

337 When directed to solve a quadratic equation by completing the square, Sam arrived at the equation $\left(x - \frac{5}{2}\right)^2 = \frac{13}{4}$. Which equation could have been the original equation given to Sam?

338 When factored completely, $x^3 - 13x^2 - 30x$ is

Algebra I Regents Bimodal Worksheet # 35 Name: _____
www.jmap.org

339 The table below shows the average diameter of a pupil in a person's eye as he or she grows older.

Age (years)	**Average Pupil Diameter** (mm)
20	4.7
30	4.3
40	3.9
50	3.5
60	3.1
70	2.7
80	2.3

What is the average rate of change, in millimeters per year, of a person's pupil diameter from age 20 to age 80?

340 A laboratory technician studied the population growth of a colony of bacteria. He recorded the number of bacteria every other day, as shown in the partial table below.

t (time, in days)	0	2	4
f(t) (bacteria)	25	15,625	9,765,625

Which function would accurately model the technician's data?

341 How many of the equations listed below represent the line passing through the points $(2,3)$ and $(4,-7)$?

$5x + y = 13$

$y + 7 = -5(x - 4)$

$y = -5x + 13$

$y - 7 = 5(x - 4)$

342 What is the product of $2x + 3$ and $4x^2 - 5x + 6$?

343 When $(2x - 3)^2$ is subtracted from $5x^2$, the result is

344 The Speedy Jet Ski Rental Company charges an insurance fee and an hourly rental rate. The total cost is modeled by the function $R(x) = 30 + 40x$. Based on this model, which statements are true?

I. $R(x)$ represents the total cost.
II. x is the number of hours rented.
III. \$40 is the insurance fee.
IV. \$30 is the hourly rental rate.

1) I, only
2) I and II, only
3) I, III, and IV, only
4) I, II, III, and IV

345 In a sequence, the first term is 4 and the common difference is 3. The fifth term of this sequence is

Algebra I Regents Bimodal Worksheet # 36 Name: _____
www.jmap.org

346 The function $h(t) = -16t^2 + 144$ represents the height, $h(t)$, in feet, of an object from the ground at t seconds after it is dropped. A realistic domain for this function is

347 If $f(x) = x^2 - 2x - 8$ and $g(x) = \frac{1}{4}x - 1$, for which values of x is $f(x) = g(x)$?

348 If the quadratic formula is used to find the roots of the equation $x^2 - 6x - 19 = 0$, the correct roots are

349 An equation used to find the velocity of an object is given as $v^2 = u^2 + 2as$, where u is the initial velocity, v is the final velocity, a is the acceleration of the object, and s is the distance traveled. When this equation is solved for a, the result is

1) $a = \frac{v^2u^2}{2s}$
2) $a = \frac{v^2 - u^2}{2s}$
3) $a = v^2 - u^2 - 2s$
4) $a = 2s(v^2 - u^2)$

350 Grisham is considering the three situations below.
I. For the first 28 days, a sunflower grows at a rate of 3.5 cm per day.
II. The value of a car depreciates at a rate of 15% per year after it is purchased.
III. The amount of bacteria in a culture triples every two days during an experiment.
Which of the statements describes a situation with an equal difference over an equal interval?

351 Which equation and ordered pair represent the correct vertex form and vertex for $j(x) = x^2 - 12x + 7$?

352 If $f(x) = x^2 + 2x + 1$ and $g(x) = 3x + 5$, then what is the value of $f(1) - g(3)$?
1) 10
2) 8
3) −10
4) −8

353 Boyle's Law involves the pressure and volume of gas in a container. It can be represented by the formula $P_1V_1 = P_2V_2$. When the formula is solved for P_2, the result is

354 What are the solutions to the equation $3x^2 + 10x = 8$?

355 In 2013, the United States Postal Service charged \$0.46 to mail a letter weighing up to 1 oz. and \$0.20 per ounce for each additional ounce. Which function would determine the cost, in dollars, $c(z)$, of mailing a letter weighing z ounces where z is an integer greater than 1?

356 The function $f(x) = 3x^2 + 12x + 11$ can be written in vertex form as

357 The zeros of the function $f(x) = 2x^2 - 4x - 6$ are

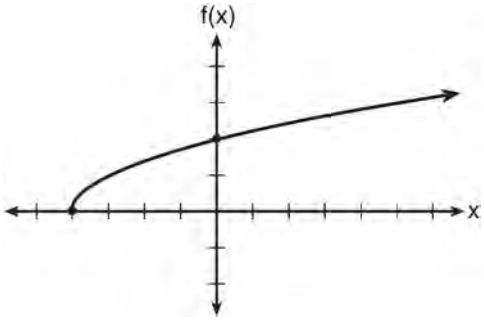
Algebra I Regents Bimodal Worksheet # 37 Name: _____

www.jmap.org

358 To watch a varsity basketball game, spectators must buy a ticket at the door. The cost of an adult ticket is \$3.00 and the cost of a student ticket is \$1.50. If the number of adult tickets sold is represented by a and student tickets sold by s, which expression represents the amount of money collected at the door from the ticket sales?

359 The third term in an arithmetic sequence is 10 and the fifth term is 26. If the first term is a_1, which is an equation for the nth term of this sequence?

360 The graph of the function $f(x) = \sqrt{x+4}$ is shown below.



The domain of the function is

361 What is the solution of the equation $2(x+2)^2 - 4 = 28$?

362 The country of Benin in West Africa has a population of 9.05 million people. The population is growing at a rate of 3.1% each year. Which function can be used to find the population 7 years from now?

363 Some banks charge a fee on savings accounts that are left inactive for an extended period of time. The equation $y = 5000(0.98)^x$ represents the value, y, of one account that was left inactive for a period of x years. What is the y-intercept of this equation and what does it represent?

364 Officials in a town use a function, C, to analyze traffic patterns. $C(n)$ represents the rate of traffic through an intersection where n is the number of observed vehicles in a specified time interval. What would be the most appropriate domain for the function?

Algebra I Regents Bimodal Worksheets
Answer Section

1 ANS:
3.5

PTS: 2 REF: 061922ai TOP: Dispersion KEY: basic

2 ANS:
$$\frac{\frac{1}{4}\text{ cup}}{4\text{ tablespoons}}$$

PTS: 2 REF: 081812ai TOP: Conversions KEY: dimensional analysis

3 ANS:
month
$$\left(\frac{\$1824-1140}{3-0\text{ yr}}\right)\left(\frac{1\text{ yr}}{12\text{ m}}\right)=\frac{\$19}{\text{m}}$$

PTS: 2 REF: 062105ai TOP: Rate of Change

4 ANS:
$(m-16)(m+4)$

PTS: 2 REF: 081803ai TOP: Factoring Polynomials
KEY: quadratic

5 ANS:
$-11.\overline{3}$
$$\frac{2}{3}\left(\frac{1}{4}x-2\right)=\frac{1}{5}\left(\frac{4}{3}x-1\right)$$
$$10(3x-24)=3(16x-12)$$
$$30x-240=48x-36$$
$$-204=18x$$
$$x=-11.\overline{3}$$

PTS: 2 REF: 011822ai TOP: Solving Linear Equations
KEY: fractional expressions

6 ANS:
$(2x+5)(2x-5)$

PTS: 2 REF: 081807ai TOP: Factoring the Difference of Perfect Squares
KEY: quadratic

7 ANS:

$y - 7 = \frac{4}{3}(x - 2)$

$m = \frac{7 - 3}{2 - -1} = \frac{4}{3}$

PTS: 2 REF: fall2302ai TOP: Writing Linear Equations
KEY: other forms

8 ANS:

distributive property of multiplication over subtraction

PTS: 2 REF: 011801ai TOP: Identifying Properties

9 ANS:

an integer ≥ 0

PTS: 2 REF: 061821ai TOP: Domain and Range
KEY: context

10 ANS:

$2a^2 + 2a - 11$

$2a^2 - 5 - 2(3 - a) = 2a^2 - 5 - 6 + 2a = 2a^2 + 2a - 11$

PTS: 2 REF: 011911ai TOP: Operations with Polynomials
KEY: subtraction

11 ANS:

$\frac{1}{3}$

$2 + 3(2a + 1) = 3(a + 2)$

$2 + 6a + 3 = 3a + 6$

$3a + 5 = 6$

$3a = 1$

$a = \frac{1}{3}$

PTS: 2 REF: 012307ai TOP: Solving Linear Equations

12 ANS:

-3

$x^2 - 6x = 12$

$x^2 - 6x + 9 = 12 + 9$

$(x - 3)^2 = 21$

PTS: 2 REF: 061812ai TOP: Solving Quadratics
KEY: completing the square

13 ANS:
2%

PTS: 2 REF: 061923ai TOP: Modeling Exponential Functions

14 ANS:
I, II, and III

PTS: 2 REF: 061823ai TOP: Transforming Formulas

15 ANS:
exponential

PTS: 2 REF: 081907ai TOP: Families of Functions

16 ANS:
$6x^3 + 4x^2 - 34$
$2\left(3x^3 + 2x^2 - 17\right)$

PTS: 2 REF: 081813ai TOP: Operations with Polynomials
KEY: addition

17 ANS:
$\left\{-\frac{4}{3}, 2\right\}$
$2x - 4 = 0 \quad 3x + 4 = 0$

$x = 2 \qquad x = -\frac{4}{3}$

PTS: 2 REF: 062212ai TOP: Zeros of Polynomials

18 ANS:
the addition property of equality

PTS: 2 REF: 061909ai TOP: Identifying Properties

19 ANS:
6

$$\frac{x-3}{4} + \frac{8}{12} = \frac{17}{12}$$

$$\frac{x-3}{4} = \frac{9}{12}$$

$$\frac{x-3}{4} = \frac{3}{4}$$

$$x - 3 = 3$$

$$x = 6$$

PTS: 2 REF: 012005ai TOP: Solving Linear Equations
KEY: fractional expressions

20 ANS:
Ryan

PTS: 2 REF: 012303ai TOP: Modeling Expressions
21 ANS:
whole numbers

PTS: 2 REF: 062206ai TOP: Domain and Range
KEY: context
22 ANS:
$x(2x - 6) = 1100$

PTS: 2 REF: 082306ai TOP: Geometric Applications of Quadratics
23 ANS:
$3.50H + 2.50P = 43$

$H + P = 14$

PTS: 2 REF: 011803ai TOP: Modeling Linear Systems
24 ANS:
19
$f(2) = 2(3^2) + 1 = 19$

PTS: 2 REF: 012001ai TOP: Functional Notation
25 ANS:
II and III, only

$10(x - 5) = -15$ $4 + 2(x - 2) = 9$ $\frac{1}{3}x = \frac{3}{2}$

$10x - 50 = -15$ $4 + 2x - 4 = 9$ $x = \frac{9}{2}$

$10x = 35$ $2x = 9$

$x = \frac{7}{2}$ $x = \frac{9}{2}$

PTS: 2 REF: 082217ai TOP: Solving Linear Equations
26 ANS:
3
$\frac{17 - 5}{5 - 1} = \frac{12}{4} = 3$

PTS: 2 REF: 062215ai TOP: Sequences KEY: difference or ratio
27 ANS:
natural numbers

PTS: 2 REF: 012313ai TOP: Domain and Range
KEY: context

28 ANS:
$2a+1$

$\frac{x-1}{2}=a$

$x-1=2a$

$x=2a+1$

PTS: 2 REF: 062223ai TOP: Transforming Formulas

29 ANS:
a closed circle at $(3,15)$ and an open circle at $(3,13)$

PTS: 2 REF: 081815ai TOP: Graphing Piecewise-Defined Functions

30 ANS:
the number of time periods

PTS: 2 REF: 062308ai TOP: Modeling Exponential Functions

31 ANS:

$T_f=\frac{Q}{mC}+T_i$

$\frac{Q}{mC}=T_f-T_i$

$\frac{Q}{mC}+T_i=T_f$

PTS: 2 REF: 012318ai TOP: Transforming Formulas

32 ANS:
$2x^2-11x-15$

$2x^2-8x-3x-15$

$2x^2-11x-15$

PTS: 2 REF: 012301ai TOP: Operations with Polynomials
KEY: subtraction

33 ANS:

$\frac{30,000\text{ items}}{1\text{ week}}\bullet\frac{1\text{ week}}{7\text{ days}}\bullet\frac{1\text{ day}}{24\text{ hrs}}\bullet\frac{1\text{ hr}}{60\text{ min}}$

PTS: 2 REF: 062309ai TOP: Conversions KEY: dimensional analysis

34 ANS:
1.49

$\frac{91\text{ cm}}{\text{day}}\times\frac{1\text{ day}}{24\text{ hrs}}\times\frac{1\text{ inch}}{2.54\text{ cm}}\approx\frac{1.49\text{ in}}{\text{hr}}$

PTS: 2 REF: 061924ai TOP: Conversions KEY: dimensional analysis

35 ANS:
$0.10d + 0.05(2d + 5) = 1.45$

PTS: 2 REF: 062213ai TOP: Modeling Linear Equations

36 ANS:
$\{0, 1, 16, 81\}$

PTS: 2 REF: 081806ai TOP: Domain and Range
KEY: limited domain

37 ANS:
6

$$116(30) + 439L \le 6500$$
$$439L \le 3020$$
$$L \le 6.879$$

PTS: 2 REF: 011904ai TOP: Modeling Linear Inequalities

38 ANS:
$c(s) = 0.75s + 5.75$

PTS: 2 REF: 062203ai TOP: Modeling Linear Functions

39 ANS:
37

$$\frac{44 + 30}{32 + 44 + 24 + 36 + 30 + 34} = 37\%$$

PTS: 2 REF: 082212ai TOP: Frequency Tables
KEY: two-way

40 ANS:
$[-4.5, \infty)$

$x = \frac{-(-2)}{2(2)} = 0.5 \quad h(0.5) = -4.5$

PTS: 2 REF: 081923ai TOP: Domain and Range
KEY: real domain, quadratic

41 ANS:
II and III

I. $f(4) = -\frac{4}{3}$ and $g(4) = 2$; II. $f(12) = 4$ and $g(12) = 4$

PTS: 2 REF: 062111ai TOP: Other Systems

42 ANS:
linear

PTS: 2 REF: 011805ai TOP: Families of Functions

43 ANS:
$b < 8$
$\frac{3}{2}b < 12$

$b < 12\left(\frac{2}{3}\right)$

$b < 8$

PTS: 2 REF: 062207ai TOP: Solving Linear Inequalities

44 ANS:
$2x$
$\frac{2x^2}{x} = 2x$

PTS: 2 REF: 082202ai TOP: Sequences KEY: difference or ratio

45 ANS:
$-27 + 15(n - 1)$

PTS: 2 REF: 081820ai TOP: Sequences KEY: explicit

46 ANS:
$2x^3 - x^2 + 3x$

PTS: 2 REF: 082206ai TOP: Operations with Polynomials
KEY: multiplication

47 ANS:
$y = 64(1 - .5)^3$

PTS: 2 REF: 012002ai TOP: Modeling Exponential Functions

48 ANS:
Anne

PTS: 2 REF: 061905ai TOP: Modeling Expressions

49 ANS:
324
$a_5 = 4(-3)^{5-1} = 324$

PTS: 2 REF: 012317ai TOP: Sequences KEY: explicit

50 ANS:
-2

PTS: 2 REF: 012007ai TOP: Graphing Polynomial Functions

51 ANS:
6

PTS: 2 REF: 081805ai TOP: Functional Notation

52 ANS:
-4 and 6

$p(x) = x^2 - 2x - 24 = (x - 6)(x + 4) = 0$

$x = 6, -4$

PTS: 2 REF: 061804ai TOP: Zeros of Polynomials

53 ANS:
$C(x) = 35x + 245$

PTS: 2 REF: 062101ai TOP: Modeling Linear Functions

54 ANS:
nonnegative integers

PTS: 2 REF: 062324ai TOP: Domain and Range
KEY: context

55 ANS:
36
The value of the third quartile is the last vertical line of the box.

PTS: 2 REF: 012306ai TOP: Box Plots KEY: interpret

56 ANS:
148

$a_n = 4n + 8$

$a_{35} = 4(35) + 8 = 148$

PTS: 2 REF: 012008ai TOP: Sequences KEY: explicit

57 ANS:
38.2

$\frac{26}{42 + 26} = 0.382$

PTS: 2 REF: 061912ai TOP: Frequency Tables
KEY: two-way

58 ANS:
$(-\infty, \infty)$

PTS: 2 REF: 062320ai TOP: Domain and Range

59 ANS:
2 and 3

$x^2 + 2x + 1 = 7x - 5$

$x^2 - 5x + 6 = 0$

$(x - 3)(x - 2) = 0$

$x = 3, 2$

PTS: 2 REF: 012312ai TOP: Quadratic-Linear Systems

60 ANS:
A and *C*, only

PTS: 2 REF: 011909ai TOP: Solving Quadratics
KEY: graph

61 ANS:
153

$k(9) = 2(9)^2 - 3\sqrt{9} = 162 - 9 = 153$

PTS: 2 REF: 061802ai TOP: Functional Notation

62 ANS:
d

$31 = 4 + (10 - 1)3$

PTS: 2 REF: 062118ai TOP: Sequences KEY: explicit

63 ANS:
$23x + 250$

PTS: 2 REF: 081901ai TOP: Modeling Expressions

64 ANS:
$a > -15b$

$a + 7b > -8b$

$a > -15b$

PTS: 2 REF: 061913ai TOP: Solving Linear Inequalities

65 ANS:
0.4

$\frac{3}{5}\left(x + \frac{4}{3}\right) = 1.04$

$3\left(x + \frac{4}{3}\right) = 5.2$

$3x + 4 = 5.2$

$3x = 1.2$

$x = 0.4$

PTS: 2 REF: 011905ai TOP: Solving Linear Equations
KEY: decimals

66 ANS:

$3y = -4x + 15$

$y + 3 = -\frac{4}{3}(x - 6)$

$3y + 9 = -4x + 24$

$3y = -4x + 15$

PTS: 2 REF: 082321ai TOP: Writing Linear Equations
KEY: other forms

67 ANS:

$(6x + 3)(6x - 3)$

PTS: 2 REF: 082203ai TOP: Factoring the Difference of Perfect Squares
KEY: quadratic

68 ANS:

$-4, 0,$ and 4

$m(x) = x(x + 4)(x - 4)$

PTS: 2 REF: 082313ai TOP: Zeros of Polynomials

69 ANS:

the height from which the ball is thrown

PTS: 2 REF: 012315ai TOP: Graphing Quadratic Functions
KEY: key features

70 ANS:

10

$\frac{4}{3} = \frac{x + 10}{15}$

$3x + 30 = 60$

$x = 10$

PTS: 2 REF: 081904ai TOP: Solving Linear Equations
KEY: fractional expressions

71 ANS:

$[2, \infty)$

PTS: 2 REF: 061816ai TOP: Domain and Range
KEY: real domain, quadratic

72 ANS:

$3x^2 - 6x + 14$

$\left(3x^2 + 4x - 8\right) + 22 - 10x = 3x^2 - 6x + 14$

PTS: 2 REF: 082302ai TOP: Operations with Polynomials
KEY: addition

73 ANS:
narrower and open downward

PTS: 2 REF: 012310ai TOP: Graphing Polynomial Functions

74 ANS: 3
$-x^3 + 10x^2 + 24x = -x(x^2 - 10x - 24) = -x(x + 2)(x - 12)$

PTS: 2 REF: 012421ai TOP: Factoring Polynomials

75 ANS:
$p < 4$

$4p + 2 < 2p + 10$

$2p < 8$

$p < 4$

PTS: 2 REF: 061801ai TOP: Solving Linear Inequalities

76 ANS:
$2x^2 + 2x + 10$

$5x^2 - x + 4 - 3x^2 + 3x + 6 = 2x^2 + 2x + 10$

PTS: 2 REF: 062304ai TOP: Operations with Polynomials
KEY: subtraction

77 ANS:
I and III
II is linear.

PTS: 2 REF: 081823ai TOP: Families of Functions

78 ANS:
$f(x) = (x + 1)(x - 3)$

PTS: 2 REF: 082315ai TOP: Graphing Quadratic Functions
KEY: key features

79 ANS:
$h + p \geq 200$

PTS: 2 REF: 012324ai TOP: Modeling Systems of Linear Inequalities

80 ANS:
shifted 3 units to the right

PTS: 2 REF: 061904ai TOP: Graphing Polynomial Functions

81 ANS:
$\frac{1.35 \text{ euros}}{1 \text{ L}} \bullet \frac{1 \text{ L}}{0.264 \text{ gal}} \bullet \frac{\$1.00}{0.622 \text{ euros}}$

PTS: 2 REF: 082324ai TOP: Conversions

82 ANS:
90

PTS: 2 REF: 061805ai TOP: Box Plots KEY: interpret

83 ANS:
-28

$3x - 24 + 4x = 8x + 4$

$7x - 24 = 8x + 4$

$-28 = x$

PTS: 2 REF: 062106ai TOP: Solving Linear Equations
KEY: integral expressions

84 ANS:
$V(x) = (6 + x)(4 + x)(8)$

PTS: 2 REF: 062312ai TOP: Geometric Applications of Quadratics

85 ANS:
zero

$b^2 - 4ac = 2^2 - 4(4)(5) = -76$

PTS: 2 REF: 061822ai TOP: Using the Discriminant

86 ANS:
$x < 4$

$-3(x - 6) > 2x - 2$

$-3x + 18 > 2x - 2$

$20 > 5x$

$4 > x$

PTS: 2 REF: 082310ai TOP: Solving Linear Inequalities

87 ANS:
$-4x^2 - 6$

PTS: 2 REF: 011813ai TOP: Operations with Polynomials
KEY: addition

88 ANS:
36

$K(-3) = 2(-3)^2 - 5(-3) + 3 = 18 + 15 + 3 = 36$

PTS: 2 REF: 062103ai TOP: Functional Notation

89 ANS:
I, II, and III

PTS: 2 REF: 012022ai TOP: Dot Plots

90 ANS:
2
$-2+8x=3x+8$

$5x=10$

$x=2$

PTS: 2 REF: 081804ai TOP: Solving Linear Equations
KEY: integral expressions

91 ANS:
exponential

PTS: 2 REF: 012316ai TOP: Families of Functions

92 ANS:
Emily, only

PTS: 2 REF: 012308ai TOP: Families of Functions

93 ANS:
2
$-4.9(0)^2+50(0)+2$

PTS: 2 REF: 011811ai TOP: Graphing Quadratic Functions
KEY: key features

94 ANS:
$x \le -15$

$-\frac{2}{5}x \ge \frac{1}{3}x+11$

$-\frac{11}{15}x \ge 11$

$-\frac{15}{11}\left(-\frac{11}{15}x\right) \le \left(-\frac{15}{11}\right)11$

$x \le -15$

PTS: 2 REF: 062322ai TOP: Solving Linear Inequalities

95 ANS: 3 PTS: 2 REF: 012423ai TOP: Zeros of Polynomials

96 ANS:
4
$3K-5=7$

$3K=12$

$K=4$

PTS: 2 REF: 082205ai TOP: Identifying Solutions

97 ANS:
$1.75 + 0.10d \geq 3.00$

PTS: 2 REF: 062314ai TOP: Modeling Linear Inequalities

98 ANS:
3.5

$$\frac{5(2x-4)}{3} = 5$$

$$10x - 20 = 15$$

$$10x = 35$$

$$x = 3.5$$

PTS: 2 REF: 082304ai TOP: Solving Linear Equations

99 ANS:
II and IV

PTS: 2 REF: 011908ai TOP: Identifying Properties

100 ANS:

$$\frac{5 \pm \sqrt{41}}{2}$$

$$\frac{5 \pm \sqrt{(-5)^2 - 4(1)(-4)}}{2(1)} = \frac{5 \pm \sqrt{41}}{2}$$

PTS: 2 REF: 061921ai TOP: Solving Quadratics
KEY: quadratic formula

101 ANS:
24

$$\frac{56}{56 + 74 + 103} \approx 0.24$$

PTS: 2 REF: 081906ai TOP: Frequency Tables
KEY: two-way

102 ANS:
7 units below the vertex of $f(x)$
$-5 - 2 = -7$

PTS: 2 REF: 081905ai TOP: Graphing Polynomial Functions

103 ANS:
$\{-16, -12, -4\}$
$f(-2) = f(-1) = -16,\ f(0) = -12,\ f(1) = -4$

PTS: 2 REF: 011914ai TOP: Domain and Range
KEY: limited domain

104 ANS:
$-13x^2 + 34x - 29$
$3(x^2 + 2x - 3) - 4(4x^2 - 7x + 5) = 3x^2 + 6x - 9 - 16x^2 + 28x - 20 = -13x^2 + 34x - 29$

PTS: 2 REF: 061803ai TOP: Operations with Polynomials
KEY: subtraction

105 ANS:
every day
$1000(0.5)^{2t} = 1000(0.5^2)^t = 1000(0.25)^t$

PTS: 2 REF: 011923ai TOP: Modeling Exponential Functions

106 ANS:
$2(x+3)^2 - 1$

PTS: 2 REF: 011819ai TOP: Graphing Polynomial Functions

107 ANS:
D and *B*

PTS: 2 REF: 082219ai TOP: Identifying Properties

108 ANS:
$0 \le t \le 14$

PTS: 2 REF: 012021ai TOP: Domain and Range
KEY: context

109 ANS:
1 and 7
$3(x-4)^2 = 27$

$(x-4)^2 = 9$

$x - 4 = \pm 3$

$x = 1, 7$

PTS: 2 REF: 011814ai TOP: Solving Quadratics
KEY: taking square roots

110 ANS:
positive real numbers
Time is continuous and positive.

PTS: 2 REF: 081921ai TOP: Domain and Range
KEY: context

111 ANS:
exponential growth function

PTS: 2 REF: 061906ai TOP: Families of Functions

112 ANS:
0.6

$$\frac{22.7\text{ m}}{\text{hr}} \times \frac{1\text{ hr}}{60\text{ min}} \times \frac{1.609\text{ km}}{1\text{ m}} = \frac{0.6\text{ km}}{\text{min}}$$

PTS: 2 REF: 062123ai TOP: Conversions KEY: dimensional analysis

113 ANS: 4
Vertex $(4, 1)$

PTS: 2 REF: 012424ai TOP: Domain and Range

114 ANS: 4 PTS: 2 REF: 012420ai TOP: Modeling Exponential Functions

115 ANS:
$\{\pm 6\}$

$$2x^2 = 72$$

$$x^2 = 36$$

$$x = \pm 6$$

PTS: 2 REF: 062318ai TOP: Solving Quadratics
KEY: taking square roots

116 ANS:
-1 and -7

$$(x+4)^2 = 9$$

$$x + 4 = \pm 3$$

$$x = -1, -7$$

PTS: 2 REF: 012015ai TOP: Solving Quadratics
KEY: taking square roots

117 ANS:
$g(x) = x(x+3)(x-4)$

PTS: 2 REF: 012322ai TOP: Zeros of Polynomials

118 ANS:
-143

$$a_{24} = -5 + (24-1)(-6) = -143$$

PTS: 2 REF: 062305ai TOP: Sequences KEY: explicit

119 ANS:
14

$$f(8) = \frac{3(8)+4}{2} = \frac{28}{2} = 14$$

PTS: 2 REF: 082201ai TOP: Functional Notation

120 ANS:

$$\frac{1500 \text{ meters}}{15.42 \text{ min}} \bullet \frac{60 \text{ min}}{1 \text{ hour}} \bullet \frac{3.281 \text{ feet}}{1 \text{ meter}} \bullet \frac{1 \text{ mile}}{5280 \text{ feet}}$$

PTS: 2 REF: 082221ai TOP: Conversions

121 ANS:

the initial height of the ball

$h(0) = -4.9(0)^2 + 6(0) + 5 = 5$

PTS: 2 REF: 011913ai TOP: Graphing Quadratic Functions

KEY: key features

122 ANS:

–27

$g(-3) = -2(-3)^2 + 3(-3) = -18 - 9 = -27$

PTS: 2 REF: 011902ai TOP: Functional Notation

123 ANS:

I and III, only

f and h's vertex is $(-2,5)$. g's axis of symmetry is $x = -1.5$.

PTS: 2 REF: 062319ai TOP: Comparing Quadratic Functions

124 ANS:

I and IV

PTS: 2 REF: 081817ai TOP: Modeling Linear Functions

125 ANS:

2 units right and 3 units up

PTS: 2 REF: 081808ai TOP: Graphing Polynomial Functions

126 ANS:

7

$8 - 1 = 7$

PTS: 2 REF: 081915ai TOP: Box Plots KEY: interpret

127 ANS:

positive rational numbers

PTS: 2 REF: 061920ai TOP: Domain and Range

KEY: context

128 ANS:

$m^2 - 6m + 9$

PTS: 2 REF: 062217ai TOP: Operations with Polynomials

KEY: multiplication

129 ANS:
$f(x)$, $q(x)$, and $p(x)$
$f(4) = q(4) = p(4) = 3$

PTS: 2 REF: 011921ai TOP: Comparing Functions

130 ANS:
I and III
$t(m) = 2(3)^{2m+1} = 2(3)^{2m}(3)^1 = 6(3)^{2m} = 6(3^2)^m = 6(9)^m$

PTS: 2 REF: 012019ai TOP: Modeling Exponential Functions

131 ANS:
$2x + 0.50y \le 100$

PTS: 2 REF: 062205ai TOP: Modeling Linear Inequalities

132 ANS:
$(4x - 9)(4x + 9)$

PTS: 2 REF: 081908ai TOP: Factoring the Difference of Perfect Squares
KEY: quadratic

133 ANS:
-2
$f(-2) = -3(-2)^2 + 10 = -12 + 10 = -2$

PTS: 2 REF: 012304ai TOP: Functional Notation

134 ANS:
0.25
$\frac{60 - 45}{60} = \frac{15}{60} = \frac{1}{4}$

PTS: 2 REF: 081814ai TOP: Frequency Tables
KEY: two-way

135 ANS:
greater than or equal to -6
$x = \frac{-2}{2(1)} = -1$; $f(-1) = (-1)^2 + 2(-1) - 5 = -6$

PTS: 2 REF: 082316ai TOP: Domain and Range

136 ANS:
$x \ge -1$

PTS: 2 REF: 011917ai TOP: Domain and Range
KEY: graph

137 ANS:
60
The value of the third quartile is the last vertical line of the box.

PTS: 2 REF: 082307ai TOP: Box Plots KEY: interpret

138 ANS:
whole numbers

PTS: 2 REF: 062116ai TOP: Domain and Range
KEY: context

139 ANS:

$$I = \sqrt{\frac{P}{R}}$$

$$P = I^2 R$$

$$I^2 = \frac{P}{R}$$

$$I = \sqrt{\frac{P}{R}}$$

PTS: 2 REF: 011920ai TOP: Transforming Formulas

140 ANS:

$$29{,}873(1-.20)^t$$

PTS: 2 REF: 012311ai TOP: Modeling Exponential Functions

141 ANS:
I, only

I. $10 \text{ mi}\left(\frac{1.609 \text{ km}}{1 \text{ mi}}\right) = 16.09 \text{ km}$; II. $44880 \text{ ft}\left(\frac{1 \text{ mi}}{5280 \text{ ft}}\right)\left(\frac{1.609 \text{ km}}{1 \text{ mi}}\right) \approx 13.6765 \text{ km}$; III.
$15560 \text{ yd}\left(\frac{3 \text{ ft}}{1 \text{ yd}}\right)\left(\frac{1 \text{ mi}}{5280 \text{ ft}}\right)\left(\frac{1.609 \text{ km}}{1 \text{ mi}}\right) \approx 14.225 \text{ km}$

PTS: 2 REF: 061815ai TOP: Conversions KEY: dimensional analysis

142 ANS: 4

$$\frac{3}{2}\left(\frac{2}{3}(3-2x) = \frac{3}{4}\right)$$

$$3 - 2x = \frac{9}{8}$$

$$24 - 16x = 9$$

$$15 = 16x$$

$$x = \frac{15}{16}$$

PTS: 2 REF: 012416ai TOP: Solving Linear Equations

143 ANS:

$$1.60x + 1.75y \le 10$$

PTS: 2 REF: 061806ai TOP: Modeling Linear Inequalities

144 ANS:
3

PTS: 2 REF: 082309ai TOP: Modeling Expressions
145 ANS:
I, II, and III
Each expression equals x^9.

PTS: 2 REF: 082311ai TOP: Powers of Powers
146 ANS:
6

PTS: 2 REF: 082208ai TOP: Modeling Expressions
147 ANS:
45.2
$\frac{38}{84} \approx 45.2\%$

PTS: 2 REF: 062317ai TOP: Frequency Tables
KEY: two-way
148 ANS:
72
$\frac{138}{192} \approx 72\%$

PTS: 2 REF: 012010ai TOP: Frequency Tables
KEY: two-way
149 ANS:
–26
$\left(6x^2 + 2x\right)(5x - 6) = 30x^3 - 36x^2 + 10x^2 - 12x = 30x^3 - 26x^2 - 12x$

PTS: 2 REF: 081824ai TOP: Operations with Polynomials
KEY: multiplication
150 ANS: 1
$(x^2 + 3x + 9)(x - 3) = x^3 - 3x^2 + 3x^2 - 9x + 9x - 27 = x^3 - 27$

PTS: 2 REF: 012415ai TOP: Operations with Polynomials
KEY: multiplication

151 ANS:
5

$$h(t) = 0$$

$$-16t^2 + 64t + 80 = 0$$

$$t^2 - 4t - 5 = 0$$

$$(t-5)(t+1) = 0$$

$$t = 5, -1$$

PTS: 2 REF: 081910ai TOP: Graphing Quadratic Functions
KEY: key features

152 ANS:

$$D + Q = 30$$

$$.10D + .25Q = 4.80$$

PTS: 2 REF: 081809ai TOP: Modeling Linear Systems

153 ANS: 2 PTS: 2 REF: 012422ai TOP: Conversions

154 ANS:
39.6%

$$\frac{58+41}{42+58+20+84+41+5} = \frac{99}{250} = 0.396$$

PTS: 2 REF: 061809ai TOP: Frequency Tables
KEY: two-way

155 ANS:
1, 2

$$-2(x-5) < 10$$

$$x - 5 > -5$$

$$x > 0$$

PTS: 2 REF: 011817ai TOP: Interpreting Solutions

156 ANS:

$$\{0, 10, 42\}$$

$$f(-2) = 0,\ f(3) = 10,\ f(5) = 42$$

PTS: 2 REF: 011812ai TOP: Domain and Range
KEY: limited domain

157 ANS:

$$600(1 + 0.024)^4$$

PTS: 2 REF: 082209ai TOP: Modeling Exponential Functions

158 ANS:
inches per minute

PTS: 2 REF: 011924ai TOP: Conversions KEY: dimensional analysis

159 ANS:
Fred said II and III because the exponents are decreasing.

PTS: 2 REF: 061819ai TOP: Modeling Expressions

160 ANS: 1
$C = 8x^3y^5$

PTS: 2 REF: 012419ai TOP: Powers of Powers

161 ANS:
$1.50(5) + 2.00m \le 19.00$

PTS: 2 REF: 062107ai TOP: Modeling Linear Inequalities

162 ANS:
$A(w) = w^2 + 7w$
$w(w + 7) = w^2 + 7w$

PTS: 2 REF: 081920ai TOP: Geometric Applications of Quadratics

163 ANS:
$f(x), h(x), g(x)$

PTS: 2 REF: 082211ai TOP: Graphing Polynomial Functions

164 ANS:
$r(x)$, and the value is -16

The minimum of $r(x)$ is -16. The minimum of $q(x)$ is -9 $\left(x = \frac{-2}{2(1)} = -1,\ q(-1) = -9 \right)$.

PTS: 2 REF: 081917ai TOP: Comparing Quadratic Functions

165 ANS:
$0 \le t \le 2$

PTS: 2 REF: 081918ai TOP: Relating Graphs to Events

166 ANS:
$x + 5$
$3(x + 4) - (2x + 7) = 3x + 12 - 2x - 7 = x + 5$

PTS: 2 REF: 062102ai TOP: Operations with Polynomials
KEY: subtraction

167 ANS:
$a + (2a - 7) = 41$

PTS: 2 REF: 061915ai TOP: Modeling Linear Equations

168 ANS:
k units to the right and a move of 5 units up

PTS: 2 REF: 062113ai TOP: Graphing Polynomial Functions

169 ANS:
-7
$f(-3) = -12 + 5 = -7$

PTS: 2 REF: 061902ai TOP: Functional Notation

170 ANS: 4
$2x - 7 > 2.5x + 3$

$-10 > 0.5x$

$-20 > x$

PTS: 2 REF: 012418ai TOP: Solving Linear Inequalities

171 ANS:
nonnegative rational numbers

PTS: 2 REF: 082322ai TOP: Domain and Range
KEY: context

172 ANS:
$\frac{2A}{b_1 + b_2}$
$2A = (b_1 + b_2)h$

$\frac{2A}{b_1 + b_2} = h$

PTS: 2 REF: 062315ai TOP: Transforming Formulas

173 ANS:
$P(c) = .75c - 9.96$
$P(c) = (.50 + .25)c - 9.96 = .75c - 9.96$

PTS: 2 REF: 011807ai TOP: Modeling Linear Functions

174 ANS:
$y = (x + 12)^2 - 162$
$y = x^2 + 24x + 144 - 18 - 144$

$y = (x + 12)^2 - 162$

PTS: 2 REF: 081911ai TOP: Vertex Form of a Quadratic

175 ANS:
$5x^2 - 12x - 2$
$2(x^2 - 1) + 3x(x - 4) = 2x^2 - 2 + 3x^2 - 12x = 5x^2 - 12x - 2$

PTS: 2 REF: 081903ai TOP: Operations with Polynomials
KEY: addition

176 ANS:
$g(x)$ is wider than $f(x)$.

PTS: 2 REF: 062316ai TOP: Graphing Absolute Value Functions

177 ANS:
$\frac{C - Ax}{B}$

$Ax + By = C$

$By = C - Ax$

$y = \frac{C - Ax}{B}$

PTS: 2 REF: 062211ai TOP: Transforming Formulas

178 ANS:
-7

$g(-4) = -(-4)^2 - (-4) + 5 = -7$

PTS: 2 REF: 062311ai TOP: Functional Notation

179 ANS:
$(4w + 1)(w - 3)$

PTS: 2 REF: 061917ai TOP: Factoring Polynomials
KEY: quadratic

180 ANS:
$2x^2 + x - 15$
(d) is the product, but not written in standard form.

PTS: 2 REF: 062108ai TOP: Operations with Polynomials
KEY: multiplication

181 ANS:
$2x^2 + x - 21$

$(2x + 7)(x - 3) = 2x^2 - 6x + 7x - 21 = 2x^2 + x - 21$

PTS: 2 REF: 082308ai TOP: Operations with Polynomials
KEY: multiplication

182 ANS:
2

$2x^3 + 3x^2 + 7x - 6$

PTS: 2 REF: 082216ai TOP: Modeling Expressions

183 ANS:
I and III, only

PTS: 2 REF: 061919ai TOP: Sequences KEY: difference or ratio

184 ANS:
$-64x^6$

PTS: 2 REF: 062114ai TOP: Powers of Powers

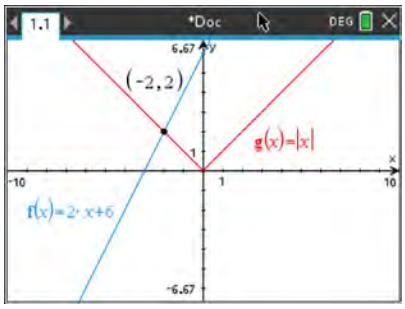
185 ANS:
exponential

PTS: 2 REF: 062117ai TOP: Families of Functions

186 ANS:
290, the amount he is guaranteed to be paid each week

PTS: 2 REF: 061817ai TOP: Modeling Linear Functions

187 ANS: 3



PTS: 2 REF: 012417ai TOP: Other Systems

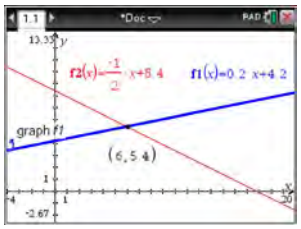
188 ANS:
65

$d = \frac{37-31}{6-3} = 2$ $a_n = 2n + 25$

$a_{20} = 2(20) + 25 = 65$

PTS: 2 REF: 061807ai TOP: Sequences KEY: explicit

189 ANS:
(6.0, 5.4)



$m = \frac{5-4.6}{4-2} = \frac{.4}{2} = 0.2$ $4(0.2x + 4.2) + 2x = 33.6$ $y = 0.2(6) + 4.2 = 5.4$

$5 = .2(4) + b$ $0.8x + 16.8 + 2x = 33.6$

$4.2 = b$ $2.8x = 16.8$

$y = 0.2x + 4.2$ $x = 6$

PTS: 2 REF: 061618ai TOP: Solving Linear Systems
KEY: substitution

190 ANS:
increasing by 5%

PTS: 2 REF: 082312ai TOP: Modeling Exponential Functions
191 ANS:
$[0,4]$

PTS: 2 REF: 082222ai TOP: Domain and Range
KEY: graph
192 ANS:
$5x\sqrt{7}$

PTS: 2 REF: fall2301ai TOP: Operations with Radicals
KEY: addition
193 ANS:
inches/minute

PTS: 2 REF: 012323ai TOP: Conversions
194 ANS:
$a_n = 4n + 8$

PTS: 2 REF: 061424ai TOP: Sequences KEY: explicit
195 ANS:
20° Celsius
$C(68) = \frac{5}{9}(68 - 32) = 20$

PTS: 2 REF: 011710ai TOP: Conversions KEY: formula

Algebra I Regents Bimodal Worksheets
Answer Section

196 ANS:
exponential growth function

PTS: 2 REF: 061406ai TOP: Families of Functions

197 ANS:
$F(x) = 2^x + 1$

PTS: 2 REF: 061415ai TOP: Families of Functions

198 ANS:
$C = 62 + 30(g - 2)$

PTS: 2 REF: 081508ai TOP: Modeling Linear Equations

199 ANS:
$p(t) = 100(3)^t$

PTS: 2 REF: 081714ai TOP: Families of Functions

200 ANS:
–1 and 2

$3x^2 - 3x - 6 = 0$

$3(x^2 - x - 2) = 0$

$3(x - 2)(x + 1) = 0$

$x = 2, -1$

PTS: 2 REF: 081513ai TOP: Zeros of Polynomials

201 ANS:
$4.50 + 0.79r \le 16.00$; 14 rides

PTS: 2 REF: 011513ai TOP: Modeling Linear Inequalities

202 ANS:
13
$w = 2(3) + 7 = 13$

PTS: 2 REF: 012302ai TOP: Identifying Solutions

203 ANS:
$x \ge 11$

$3x + 2 \le 5x - 20$

$22 \le 2x$

$11 \le x$

PTS: 2 REF: 061609ai TOP: Solving Linear Inequalities

204 ANS:
A

PTS: 2 REF: 061420ai TOP: Functional Notation

205 ANS:
$c = 60 + 0.05d$

PTS: 2 REF: 061422ai TOP: Modeling Linear Equations

206 ANS:
$x = 4 \pm 2\sqrt{10}$

$x^2 - 8x + 16 = 24 + 16$

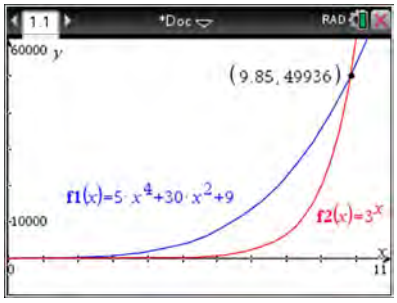
$(x - 4)^2 = 40$

$x - 4 = \pm\sqrt{40}$

$x = 4 \pm 2\sqrt{10}$

PTS: 2 REF: 061523ai TOP: Solving Quadratics
KEY: completing the square

207 ANS:
9



PTS: 2 REF: 061621ai TOP: Families of Functions

208 ANS:
quadratic

PTS: 2 REF: 061624ai TOP: Families of Functions

209 ANS:
15 and –2

$x^2 - 13x - 30 = 0$

$(x - 15)(x + 2) = 0$

$x = 15, -2$

PTS: 2 REF: 061510ai TOP: Zeros of Polynomials

210 ANS:
$f(x) = (x - 5)(x + 6)$

PTS: 2 REF: 061412ai TOP: Zeros of Polynomials

211 ANS:
$5x^2 + 11x - 13$

PTS: 2 REF: 061403ai TOP: Operations with Polynomials
KEY: subtraction

212 ANS:
$-2g - 11$
$2(3g - 4) - (8g + 3) = 6g - 8 - 8g - 3 = -2g - 11$

PTS: 2 REF: 011707ai TOP: Operations with Polynomials
KEY: subtraction

213 ANS:
65

$a + p = 165 \qquad 1.75(165 - p) + 2.5p = 337.5$

$1.75a + 2.5p = 337.5 \quad 288.75 - 1.75p + 2.5p = 337.5$

$0.75p = 48.75$

$p = 65$

PTS: 2 REF: 061506ai TOP: Modeling Linear Systems

214 ANS:
12

$$\frac{0.8(10^2) - 0.8(5^2)}{10 - 5} = \frac{80 - 20}{5} = 12$$

PTS: 2 REF: 011521ai TOP: Rate of Change

215 ANS:
4

$16^{2t} = n^{4t}$

$(16^2)^t = (n^4)^t$

$((4^2)^2)^t = ((n^2)^2)^t$

PTS: 2 REF: 011519ai TOP: Modeling Exponential Functions

216 ANS:
I, II, and IV

PTS: 2 REF: 081509ai TOP: Factoring Polynomials
KEY: quadratic

217 ANS:
It decreases 22% per year.

PTS: 2 REF: 081624ai TOP: Modeling Exponential Functions

218 ANS:
2% growth

PTS: 2 REF: 011608ai TOP: Modeling Exponential Functions

219 ANS:
up

PTS: 2 REF: 081501ai TOP: Graphing Polynomial Functions

220 ANS:
hours worked per week

PTS: 2 REF: 011501ai TOP: Modeling Linear Functions

221 ANS:
$4(3x+5)(3x-5)$

$36x^2 - 100 = 4(9x^2 - 25) = 4(3x+5)(3x-5)$

PTS: 2 REF: 081608ai TOP: Factoring the Difference of Perfect Squares
KEY: quadratic

222 ANS:
-2

PTS: 2 REF: 011712ai TOP: Graphing Absolute Value Functions

223 ANS:
$x > 9$

$7 - \frac{2}{3}x < x - 8$

$15 < \frac{5}{3}x$

$9 < x$

PTS: 2 REF: 011507ai TOP: Solving Linear Inequalities

224 ANS:
$y \geq 2x - 3$

PTS: 2 REF: 011605ai TOP: Graphing Linear Inequalities

225 ANS:
$2x^2 + 7x - 13$

$3(x^2 - 1) - (x^2 - 7x + 10)$

$3x^2 - 3 - x^2 + 7x - 10$

$2x^2 + 7x - 13$

PTS: 2 REF: 061610ai TOP: Operations with Polynomials
KEY: subtraction

226 ANS:
distributive property of multiplication over subtraction

PTS: 2 REF: 081701ai TOP: Identifying Properties

227 ANS:
17.06
$119.67(0.61)^5 - 119.67(0.61)^3 \approx 17.06$

PTS: 2 REF: 011603ai TOP: Evaluating Functions

228 ANS:
$r = \sqrt{\frac{V}{\pi h}}$

PTS: 2 REF: 011516ai TOP: Transforming Formulas

229 ANS:
$\frac{I}{Pt}$

PTS: 2 REF: 011606ai TOP: Transforming Formulas

230 ANS:
8
$L + S = 20 \qquad 27.98L + 10.98(20 - L) = 355.60$
$27.98L + 10.98S = 355.60 \quad 27.98L + 219.60 - 10.98L = 355.60$
$17L = 136$
$L = 8$

PTS: 2 REF: 081510ai TOP: Modeling Linear Systems

231 ANS:
2589
$25{,}000(0.86)^2 - 25{,}000(0.86)^3 = 18490 - 15901.40 = 2588.60$

PTS: 2 REF: 011508ai TOP: Functional Notation

232 ANS:
$(3m - 10)(3m + 10)$

PTS: 2 REF: 062301ai TOP: Factoring the Difference of Perfect Squares

233 ANS:
6
$x^2 - 12x + 7$
$x^2 - 12x + 36 - 29$
$(x - 6)^2 - 29$

PTS: 2 REF: 081520ai TOP: Vertex Form of a Quadratic

234 ANS:

$-\frac{5}{6}$

$36x^2 = 25$

$x^2 = \frac{25}{36}$

$x = \pm\frac{5}{6}$

PTS: 2 REF: 011715ai TOP: Solving Quadratics
KEY: taking square roots

235 ANS:

$1.25r + 2g \le 50$

$r \ge 10$

$g \ge 12$

PTS: 2 REF: 081810ai TOP: Modeling Systems of Linear Inequalities

236 ANS:

–2

$\frac{1}{2}x + 3 = |x| \quad -\frac{1}{2}x - 3 = x$

$\frac{1}{2}x + 3 = x \qquad -x - 6 = 2x$

$-6 = 3x$

$x + 6 = 2x$

$-2 = x$

$6 = x$

PTS: 2 REF: 011617ai TOP: Other Systems

237 ANS:

The graph of $f(x)$ is narrower than the graph of $g(x)$, and its vertex is moved to the right 2 units and up 1 unit.

PTS: 2 REF: 011512ai TOP: Graphing Polynomial Functions

238 ANS:

$y > 0$

PTS: 2 REF: 011619ai TOP: Domain and Range
KEY: real domain, exponential

239 ANS:

$f(x) = x(x + 3)(x - 4)$

PTS: 2 REF: 061710ai TOP: Zeros of Polynomials

240 ANS:
2

$|x + 2| = 3x - 2$

$x + 2 = 3x - 2$

$4 = 2x$

$x = 2$

PTS: 2 REF: 081702ai TOP: Other Systems

241 ANS: 3 PTS: 2 REF: 012407ai TOP: Graphing Polynomial Functions

242 ANS:
h(x), f(x), g(x)

Over the interval $0 \le x \le 3$, the average rate of change for $h(x) = \frac{9-2}{3-0} = \frac{7}{3}$, $f(x) = \frac{7-1}{3-0} = \frac{6}{3} = 2$, and $g(x) = \frac{3-0}{3-0} = \frac{3}{3} = 1$.

PTS: 2 REF: spr1301ai TOP: Rate of Change

243 ANS:
wider and opens downward

PTS: 2 REF: 081417ai TOP: Graphing Polynomial Functions

244 ANS:
8.3

$4(x - 7) = 0.3(x + 2) + 2.11$

$4x - 28 = 0.3x + 0.6 + 2.11$

$3.7x - 28 = 2.71$

$3.7x = 30.71$

$x = 8.3$

PTS: 2 REF: 061719ai TOP: Solving Linear Equations
KEY: decimals

245 ANS:
whole numbers

PTS: 2 REF: 011506ai TOP: Domain and Range
KEY: context

246 ANS:
$0.05(x + 4) + 0.10(x) = \$1.25$

PTS: 2 REF: 061416ai TOP: Modeling Linear Equations

247 ANS:
$f(x)$

PTS: 2 REF: 061606ai TOP: Families of Functions

248 ANS:
$y \geq -3x + 4$

PTS: 2 REF: 061505ai TOP: Graphing Linear Inequalities

249 ANS:
2

PTS: 2 REF: 011601ai TOP: Vertex Form of a Quadratic

250 ANS:
$x^2 - 8(x - 1) = 17$

PTS: 2 REF: 081723ai TOP: Modeling Quadratics

251 ANS:
$280 - 30(w - 1)$

PTS: 2 REF: 011718ai TOP: Modeling Expressions

252 ANS:
$t = \sqrt{\frac{2d}{a}}$

$d = \frac{1}{2}at^2$

$2d = at^2$

$\frac{2d}{a} = t^2$

$\sqrt{\frac{2d}{a}} = t$

PTS: 2 REF: 061519ai TOP: Transforming Formulas

253 ANS:
$(10 + x)(12 + x) = 180$

PTS: 2 REF: 011611ai TOP: Geometric Applications of Quadratics

254 ANS:
-1 and 6
$f(x) = x^2 - 5x - 6 = (x + 1)(x - 6) = 0$

$x = -1, 6$

PTS: 2 REF: 061612ai TOP: Zeros of Polynomials

255 ANS:
no solution
$3(-2x + 2x + 8) = 12$

$24 \neq 12$

PTS: 2 REF: 061708ai TOP: Solving Linear Systems
KEY: substitution

256 ANS:
$-2 \pm 2\sqrt{5}$

$x^2 + 4x = 16$

$x^2 + 4x + 4 = 16 + 4$

$(x + 2)^2 = 20$

$x + 2 = \pm\sqrt{4 \cdot 5}$

$= -2 \pm 2\sqrt{5}$

PTS: 2 REF: 061410ai TOP: Solving Quadratics
KEY: completing the square

257 ANS:
60

$\frac{30}{30 + 12 + 8} = 0.6$

PTS: 2 REF: 061615ai TOP: Frequency Tables
KEY: two-way

258 ANS:
$y = 14.1x + 5.8$

PTS: 2 REF: 081421ai TOP: Regression KEY: linear

259 ANS:
4

$\frac{x - 2}{3} = \frac{4}{6}$

$6x - 12 = 12$

$6x = 24$

$x = 4$

PTS: 2 REF: 081420ai TOP: Solving Linear Equations
KEY: fractional expressions

260 ANS:
1.7%

PTS: 2 REF: 061517ai TOP: Modeling Exponential Functions

261 ANS:
$\{0, 1, 4\}$

PTS: 2 REF: 081710ai TOP: Domain and Range
KEY: limited domain

262 ANS:
0.2083 minute

$12.5 \sec \times \frac{1 \min}{60 \sec} = 0.208\overline{3} \min$

PTS: 2 REF: 061608ai TOP: Conversions KEY: dimensional analysis

263 ANS:
whole numbers greater than or equal to one

PTS: 2 REF: 081620ai TOP: Domain and Range
KEY: context

264 ANS:
I, II, and III

PTS: 2 REF: 081709ai TOP: Modeling Linear Functions

265 ANS:
2 and a

PTS: 2 REF: 011702ai TOP: Solving Quadratics
KEY: factoring

266 ANS:
$m + f = 3.95$

$f + 0.005 = m$

PTS: 2 REF: 081419ai TOP: Modeling Linear Systems

267 ANS:
$6x^2 - 28x + 30$

PTS: 2 REF: 011510ai TOP: Operations with Polynomials
KEY: multiplication

268 ANS: 1 PTS: 2 REF: 012412ai TOP: Modeling Linear Inequalities

269 ANS:
whole numbers

PTS: 2 REF: 011719ai TOP: Domain and Range
KEY: context

270 ANS:

$x \le -\frac{18}{5}$

$2 + \frac{4}{9}x \ge 4 + x$

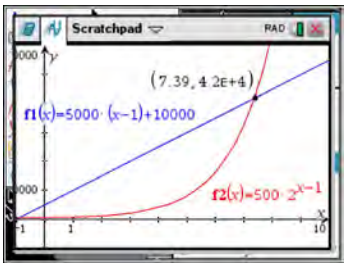
$-2 \ge \frac{5}{9}x$

$x \le -\frac{18}{5}$

PTS: 2 REF: 081711ai TOP: Solving Linear Inequalities

271 ANS:

8



x	$A = 5000(x-1)+10000$	$B = 500(2)^{x-1}$
6	35,000	16,000
7	40,000	32,000
8	45,000	64,000
9	50,000	128,000

PTS: 2 REF: 081518ai TOP: Families of Functions

272 ANS:

5*b*

PTS: 2 REF: 081712ai TOP: Modeling Expressions

273 ANS:

Pelican Beach

PTS: 2 REF: 011514ai TOP: Central Tendency and Dispersion

274 ANS:

$4 \pm \sqrt{26}$

$x^2 - 8x + 16 = 10 + 16$

$(x-4)^2 = 26$

$x - 4 = \pm\sqrt{26}$

$x = 4 \pm \sqrt{26}$

PTS: 2 REF: 061722ai TOP: Solving Quadratics
KEY: completing the square

275 ANS:

$3x^2 - 14x + 14$

$3(x^2 - 4x + 4) - 2x + 2 = 3x^2 - 12x + 12 - 2x + 2 = 3x^2 - 14x + 14$

PTS: 2 REF: 081524ai TOP: Operations with Polynomials
KEY: multiplication

276 ANS:

-7 and 3

$(x+2)^2 - 25 = 0$

$((x+2)+5))((x+2)-5)) = 0$

$x = -7, 3$

PTS: 2 REF: 081418ai TOP: Zeros of Polynomials

277 ANS:

$b = \frac{2V}{ah} - c$

$V = \frac{1}{2}a(b+c)h$

$2V = a(b+c)h$

$\frac{2V}{ah} = b + c$

$\frac{2V}{ah} - c = b$

PTS: 2 REF: 082224ai TOP: Transforming Formulas

278 ANS:

Lynn, only

$f(3) = -2(3)^2 + 32 = -18 + 32 = 14$

PTS: 2 REF: 061705ai TOP: Functional Notation

279 ANS:
II and IV

PTS: 2 REF: 081511ai TOP: Defining Functions
KEY: mixed

280 ANS:
–5 and 5

PTS: 2 REF: 081403ai TOP: Solving Quadratics
KEY: taking square roots

281 ANS:
speed of the car

PTS: 2 REF: 011709ai TOP: Modeling Linear Functions

282 ANS:
III, only

PTS: 2 REF: 061516ai TOP: Analysis of Data

283 ANS:
–18.825

$6\left(\frac{5}{6}\left(\frac{3}{8}-x\right)=16\right)$

$8\left(5\left(\frac{3}{8}-x\right)=96\right)$

$15-40x=768$

$-40x=753$

$x=-18.825$

PTS: 2 REF: 081713ai TOP: Solving Linear Equations
KEY: fractional expressions

284 ANS:
II, only

I. $-\frac{5}{8}+\frac{3}{5}=\frac{-1}{40}$; III. $\left(\sqrt{5}\right)\cdot\left(\sqrt{5}\right)=\frac{5}{1}$; IV. $3\cdot\left(\sqrt{49}\right)=\frac{21}{1}$

PTS: 2 REF: 011604ai TOP: Operations with Radicals
KEY: classify

285 ANS:
$150(0.85)^m$

PTS: 2 REF: 081617ai TOP: Modeling Exponential Functions

286 ANS:
5.4
$\frac{36.6 - 15}{4 - 0} = \frac{21.6}{4} = 5.4$

PTS: 2 REF: 061511ai TOP: Rate of Change

287 ANS:
$2x + 3.50 = 14.50$

PTS: 2 REF: 081614ai TOP: Modeling Linear Equations

288 ANS:
opens upward and is narrower

PTS: 2 REF: 011717ai TOP: Graphing Polynomial Functions

289 ANS:
10
$4x - 5(0) = 40$

$4x = 40$

$x = 10$

PTS: 2 REF: 081408ai TOP: Graphing Linear Functions

290 ANS:
greater than or equal to –9
$f(x) = x^2 + 2x - 8 = x^2 + 2x + 1 - 9 = (x + 1)^2 - 9$

PTS: 2 REF: 061611ai TOP: Domain and Range
KEY: real domain, quadratic

291 ANS:
the amount spent to manufacture each radio

PTS: 2 REF: 061407ai TOP: Modeling Linear Functions

292 ANS: 4
$\frac{67}{42 + 67} \approx 0.615$

PTS: 2 REF: 012409ai TOP: Frequency Tables
KEY: two-way

293 ANS:
hour 0 to hour 1
The graph is steepest between hour 0 and hour 1.

PTS: 2 REF: 081601ai TOP: Rate of Change

294 ANS:
$h < 14$
$2h + 8 > 3h - 6$

$14 > h$

$h < 14$

PTS: 2 REF: 081607ai TOP: Solving Linear Inequalities

295 ANS:
$3000(1 + 0.02)^{16}$

PTS: 2 REF: 011504ai TOP: Modeling Exponential Functions

296 ANS:
nonnegative rational numbers

PTS: 2 REF: 061623ai TOP: Domain and Range
KEY: context

297 ANS:
$\frac{120 \text{ ft}^3}{1} \bullet \frac{1 \text{ load}}{8 \text{ ft}^3} \bullet \frac{10 \text{ min}}{1 \text{ load}} \bullet \frac{1 \text{ hr}}{60 \text{ min}}$

PTS: 2 REF: 061720ai TOP: Conversions KEY: dimensional analysis

298 ANS:
$(p^2 + 9)(p + 3)(p - 3)$

PTS: 2 REF: 011522ai TOP: Factoring the Difference of Perfect Squares
KEY: higher power

299 ANS:
linear

PTS: 2 REF: 081717ai TOP: Families of Functions

300 ANS:
$x^2 + 8^2 = (x + 2)^2$

PTS: 2 REF: spr1304ai TOP: Geometric Applications of Quadratics

301 ANS:
–0.93

PTS: 2 REF: 061411ai TOP: Correlation Coefficient

302 ANS:
$f(x) = \begin{cases} x^2, x < 1 \\ \frac{1}{2}x + \frac{1}{2}, x > 1 \end{cases}$

PTS: 2 REF: 081422ai TOP: Graphing Piecewise-Defined Functions

303 ANS:
$0 \le y \le 8$
$f(2) = 0$
$f(6) = 8$

PTS: 2 REF: 081411ai TOP: Domain and Range
KEY: limited domain

304 ANS:
27
$f(8) = \frac{1}{2}(8)^2 - \left(\frac{1}{4}(8) + 3\right) = 32 - 5 = 27$

PTS: 2 REF: 081704ai TOP: Functional Notation

305 ANS:
$q(x) = -\frac{1}{2}(x - 15)^2 + 25$

Vertex $(15, 25)$, point $(10, 12.5)$ $12.5 = a(10 - 15)^2 + 25$

$-12.5 = 25a$

$-\frac{1}{2} = a$

PTS: 2 REF: 061716ai TOP: Vertex Form of a Quadratic

306 ANS:
$a + c = 150$
$10.25a + 7.75c = 1470$

PTS: 2 REF: 061605ai TOP: Modeling Linear Systems

307 ANS:
positive integers

PTS: 2 REF: 011615ai TOP: Domain and Range
KEY: context

308 ANS:
$-3 \pm \sqrt{7}$

PTS: 2 REF: 081523ai TOP: Solving Quadratics
KEY: taking square roots

309 ANS:

$\sqrt{\frac{3V}{\pi h}}$

$V = \frac{1}{3}\pi r^2 h$

$3V = \pi r^2 h$

$\frac{3V}{\pi h} = r^2$

$\sqrt{\frac{3V}{\pi h}} = r$

PTS: 2 REF: 061423ai TOP: Transforming Formulas

310 ANS:

$\frac{5280 \text{ ft}}{1 \text{ mi}}$

PTS: 2 REF: 011502ai TOP: Conversions KEY: dimensional analysis

311 ANS:

$\frac{4.5 \text{ hr}}{50 \text{ km}} \bullet \frac{1.609 \text{ km}}{1 \text{ mi}} \bullet \frac{60 \text{ min}}{1 \text{ hr}}$

PTS: 2 REF: 062222ai TOP: Conversions KEY: dimensional analysis

312 ANS:

addition property of equality

PTS: 2 REF: 061401ai TOP: Identifying Properties

313 ANS:

7

$5r = a_2 \quad a_2 r = 245 \quad 5r = \frac{245}{r}$

$a_2 = \frac{245}{r} \quad 5r^2 = 245$

$r^2 = 49$

$r = \pm 7$

PTS: 2 REF: 081924ai TOP: Sequences KEY: difference or ratio

314 ANS:

$A = 1000(1 + 0.013)^2$

PTS: 2 REF: 061712ai TOP: Modeling Exponential Functions

315 ANS:

$2lw$

PTS: 2 REF: 061702ai TOP: Dependent and Independent Variables

316 ANS:
-1

$$\frac{\sqrt{2\left(\frac{1}{2}\right)+3}}{6\left(\frac{1}{2}\right)-5}=\frac{\sqrt{4}}{-2}=\frac{2}{-2}=-1$$

PTS: 2 REF: 081512ai TOP: Functional Notation

317 ANS:
$0.75(7)+1.25b \le 22$

PTS: 2 REF: 081505ai TOP: Modeling Linear Inequalities

318 ANS: 1 PTS: 2 REF: 012413ai TOP: Graphing Quadratic Functions

319 ANS:
$P(x)=-0.5x^2+500x-350$
$P(x)=-0.5x^2+800x-100-(300x+250)=-0.5x^2+500x-350$

PTS: 2 REF: 081406ai TOP: Operations with Functions

320 ANS:
28%

$$\frac{14}{16+20+14}=28\%$$

PTS: 2 REF: 011705ai TOP: Frequency Tables
KEY: two-way

321 ANS:
$(7x-6)(7x+6)$

PTS: 2 REF: 081703ai TOP: Factoring the Difference of Perfect Squares
KEY: quadratic

322 ANS: 3 PTS: 2 REF: 012414ai TOP: Modeling Expressions

323 ANS:
y is the total cost, x is the number of months of service, \$40 is the installation fee, and \$90 is the service charge per month.

PTS: 2 REF: 081402ai TOP: Modeling Linear Functions

324 ANS:
$12x-24=60$

PTS: 2 REF: 081616ai TOP: Modeling Linear Equations

325 ANS:
$0 \le t \le 1.5$
$0 = -16t^2 + 24t$
$0 = -8t(2t - 3)$
$t = 0, \frac{3}{2}$

PTS: 2 REF: 061724ai TOP: Graphing Quadratic Functions
KEY: key features

326 ANS:
$m + g \le 40$
$12m + 14g \ge 250$

PTS: 2 REF: 061711ai TOP: Modeling Systems of Linear Inequalities

327 ANS:
$[-5, \infty)$

PTS: 2 REF: 012018ai TOP: Domain and Range
KEY: real domain, absolute value

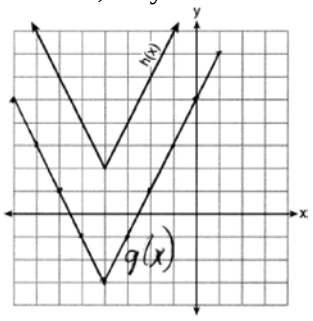
328 ANS: 3
$a_{11} = 3(-2)^{11-1} = 3072$

PTS: 2 REF: 012404ai TOP: Sequences KEY: explicit

329 ANS:
$3x - 1 = \pm 5$

PTS: 2 REF: 061521ai TOP: Solving Quadratics
KEY: taking square roots

330 ANS:
I and III, only



PTS: 2 REF: 081718ai TOP: Comparing Functions

331 ANS: 2 PTS: 2 REF: 012406ai TOP: Operations with Polynomials
KEY: subtraction

332 ANS:
$4(2x+3)(2x-3)$
$16x^2-36=4(2x+3)(2x-3)$

PTS: 2 REF: 011701ai TOP: Factoring the Difference of Perfect Squares
KEY: quadratic

333 ANS:
$j^2+2j=783$

PTS: 2 REF: 081409ai TOP: Modeling Quadratics

334 ANS:
$y=x^2+10x+24$
$(x+4)(x+6)=0$

$x^2+10x+24=0$

PTS: 2 REF: spr1303ai TOP: Zeros of Polynomials

335 ANS:
$2.5<x<5.5$

PTS: 2 REF: 061409ai TOP: Graphing Quadratic Functions
KEY: key features

336 ANS:
8.25
$\frac{7}{3}\left(x+\frac{9}{28}\right)=20$

$\frac{7}{3}x+\frac{3}{4}=\frac{80}{4}$

$\frac{7}{3}x=\frac{77}{4}$

$x=\frac{33}{4}=8.25$

PTS: 2 REF: 061405ai TOP: Solving Linear Equations
KEY: fractional expressions

337 ANS:

$x^2 - 5x + 3 = 0$

$x^2 - 5x = -3$

$x^2 - 5x + \frac{25}{4} = \frac{-12}{4} + \frac{25}{4}$

$\left(x - \frac{5}{2}\right)^2 = \frac{13}{4}$

PTS: 2 REF: 061518ai TOP: Solving Quadratics
KEY: completing the square

338 ANS:

$x(x + 2)(x - 15)$

PTS: 2 REF: 011612ai TOP: Factoring Polynomials
KEY: higher power

339 ANS:

–0.04

$\frac{4.7 - 2.3}{20 - 80} = \frac{2.4}{-60} = -0.04.$

PTS: 2 REF: 081414ai TOP: Rate of Change

340 ANS:

$f(t) = 25^{t+1}$

PTS: 2 REF: 061513ai TOP: Families of Functions

341 ANS:

3

$m = \frac{3 - -7}{2 - 4} = -5$ $3 = (-5)(2) + b$ $y = -5x + 13$ represents the line passing through the points $(2, 3)$ and $(4, -7)$. The $b = 13$
fourth equation may be rewritten as $y = 5x - 13$, so is a different line.

PTS: 2 REF: 081720ai TOP: Writing Linear Equations
KEY: other forms

342 ANS:

$8x^3 + 2x^2 - 3x + 18$

$(2x + 3)(4x^2 - 5x + 6) = 8x^3 - 10x^2 + 12x + 12x^2 - 15x + 18 = 8x^3 + 2x^2 - 3x + 18$

PTS: 2 REF: 081612ai TOP: Operations with Polynomials
KEY: multiplication

343 ANS:

$x^2 + 12x - 9$

$5x^2 - (4x^2 - 12x + 9) = x^2 + 12x - 9$

PTS: 2 REF: 011610ai TOP: Operations with Polynomials
KEY: multiplication

344 ANS: 2 PTS: 2 REF: 012403ai TOP: Modeling Linear Functions

345 ANS:

16

$a_n = 3n + 1$

$a_5 = 3(5) + 1 = 16$

PTS: 2 REF: 061613ai TOP: Sequences KEY: explicit

346 ANS:

$0 \le t \le 3$

$0 = -16t^2 + 144$

$16t^2 = 144$

$t^2 = 9$

$t = 3$

PTS: 2 REF: 081423ai TOP: Domain and Range
KEY: context

347 ANS:

-1.75 and 4

$x^2 - 2x - 8 = \frac{1}{4}x - 1$

$4x^2 - 8x - 32 = x - 4$

$4x^2 - 9x - 28 = 0$

$(4x + 7)(x - 4) = 0$

$x = -\frac{7}{4}, 4$

PTS: 2 REF: 081517ai TOP: Quadratic-Linear Systems

348 ANS:

$3 \pm 2\sqrt{7}$

$x^2 - 6x = 19$

$x^2 - 6x + 9 = 19 + 9$

$(x-3)^2 = 28$

$x - 3 = \pm\sqrt{4 \cdot 7}$

$x = 3 \pm 2\sqrt{7}$

PTS: 2 REF: fall1302ai TOP: Solving Quadratics
KEY: quadratic formula

349 ANS: 2

$v^2 - u^2 = 2as$

$\frac{v^2 - u^2}{2s} = \frac{2as}{2s}$

$\frac{v^2 - u^2}{2s} = a$

PTS: 2 REF: 012408ai TOP: Transforming Formulas

350 ANS:

I, only

PTS: 2 REF: 011623ai TOP: Families of Functions

351 ANS:

$j(x) = (x-6)^2 - 29,\ (6, -29)$

$j(x) = x^2 - 12x + 36 + 7 - 36$

$= (x-6)^2 - 29$

PTS: 2 REF: 061616ai TOP: Vertex Form of a Quadratic

352 ANS: 3

$f(1) = 1^2 + 2(1) + 1 = 4$

$g(3) = 3(3) + 5 = 14$

$f(1) - g(3) = -10$

PTS: 2 REF: 012410ai TOP: Functional Notation

353 ANS:

$\frac{P_1 V_1}{V_2}$

PTS: 2 REF: 011704ai TOP: Transforming Formulas

354 ANS:

$\frac{2}{3}$ and -4

$3x^2 + 10x - 8 = 0$

$(3x - 2)(x + 4) = 0$

$x = \frac{2}{3}, -4$

PTS: 2 REF: 081619ai TOP: Solving Quadratics
KEY: factoring

355 ANS:

$c(z) = 0.20(z - 1) + 0.46$

PTS: 2 REF: 011523ai TOP: Modeling Linear Functions

356 ANS:

$f(x) = 3(x + 2)^2 - 1$

$3(x^2 + 4x + 4) - 12 + 11$

$3(x + 2)^2 - 1$

PTS: 2 REF: 081621ai TOP: Vertex Form of a Quadratic

357 ANS:

3 and -1

$2x^2 - 4x - 6 = 0$

$2(x^2 - 2x - 3) = 0$

$2(x - 3)(x + 1) = 0$

$x = 3, -1$

PTS: 2 REF: 011609ai TOP: Zeros of Polynomials

358 ANS:

$3.00a + 1.50s$

PTS: 2 REF: 081503ai TOP: Modeling Expressions

359 ANS:

$a_n = 8n - 14$

PTS: 2 REF: 081416ai TOP: Sequences KEY: explicit

360 ANS:

$\{x \mid x \geq -4\}$

PTS: 2 REF: 061509ai TOP: Domain and Range
KEY: graph

361 ANS:
2 and –6

$2(x+2)^2 = 32$

$(x+2)^2 = 16$

$x+2 = \pm 4$

$x = -6, 2$

PTS: 2 REF: 061619ai TOP: Solving Quadratics
KEY: taking square roots

362 ANS:
$f(t) = (9.05 \times 10^6)(1+0.031)^7$

PTS: 2 REF: 081507ai TOP: Modeling Exponential Functions

363 ANS:
5000, the amount of money in the account initially

PTS: 2 REF: 011515ai TOP: Modeling Exponential Functions

364 ANS:
$\{0, 1, 2, 3, \ldots\}$
There are no negative or fractional cars.

PTS: 2 REF: 061402ai TOP: Domain and Range
KEY: context