The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

INTEGRATED ALGEBRA

Wednesday, June 1, 2016 — 1:15 to 4:15 p.m., only

Student Name: _Steve Watson_

School Name: _JMAP. ORG_

The possession or use of any communications device is strictly prohibited when taking this examination. If you have or use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

Print your name and the name of your school on the lines above.

A separate answer sheet for Part I has been provided to you. Follow the instructions from the proctor for completing the student information on your answer sheet.

This examination has four parts, with a total of 39 questions. You must answer all questions in this examination. Record your answers to the Part I multiple-choice questions on the separate answer sheet. Write your answers to the questions in Parts II, III, and IV directly in this booklet. All work should be written in pen, except graphs and drawings, which should be done in pencil. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. The formulas that you may need to answer some questions in this examination are found at the end of the examination. This sheet is perforated so you may remove it from this booklet.

Scrap paper is not permitted for any part of this examination, but you may use the blank spaces in this booklet as scrap paper. A perforated sheet of scrap graph paper is provided at the end of this booklet for any question for which graphing may be helpful but is not required. You may remove this sheet from this booklet. Any work done on this sheet of scrap graph paper will *not* be scored.

When you have completed the examination, you must sign the statement printed at the end of the answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet cannot be accepted if you fail to sign this declaration.


Notice...

A graphing calculator and a straightedge (ruler) must be available for you to use while taking this examination.
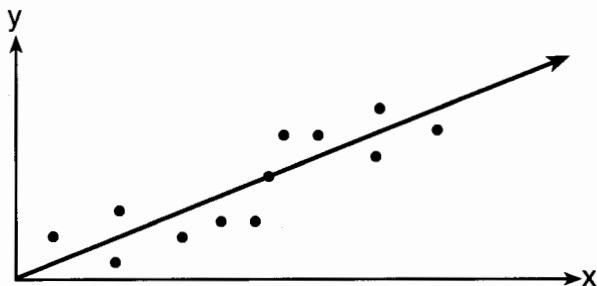
DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

Part I

Answer all 30 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. For each question, write on the separate answer sheet the numeral preceding the word or expression that best completes the statement or answers the question. [60]

Use this space for computations.

1 A line of best fit has been drawn on the scatter plot below.

The relationship between these variables can be described as having

(1) a negative correlation   (3) a positive correlation

(2) no correlation   (4) zero correlation

(handwritten) (1,50, 90)

goes through (0,0) → (0,0)

x min	y
0	0 ← y-intercept
1.50	90
4.00	240 ← answer

2 The amount of money spent at a parking meter varies directly with the amount of time spent parked in the parking space. Noah spent $1.50 to park 90 minutes. How many minutes can he park for $4.00?

(1) 667   (3) 240

(2) 360   (4) 135

(handwritten)
$$slope = \frac{y_2 - y_1}{x_2 - x_1}$$
$$M = \frac{90 - 0}{1.5 - 0}$$
$$M = 60$$
$$y = mx + b$$
$$y = 60x$$

3 An athlete has one blue jersey and one orange jersey, as well as 3 different colors of pants. He also has 2 different colors of helmets. How many distinct uniforms consisting of one helmet, one jersey, and one pair of pants does the athlete have?

(1) 5   (3) 7

(2) 6   (4) 12

(handwritten)
Helmet Jersey Pants
Choices Choices Choices

$$\boxed{2} \times \boxed{2} \times \boxed{3} = 12$$

4 Given:

$$A = \{0,1,2,3,4\}$$
$$B = \{0,2,3,5,7\}$$
$$C = \{0,2,4,6,8\}$$

What is the intersection of sets A, B, and C?

(1) {0}

(2) {0,2}

(3) {0,2,3,4}

(4) {0,1,2,3,4,5,6,7,8}

(handwritten work:)

A (0) 1 (2) 3 4 ✗✗ ✗ ✗

B (0) ✗ (2) 3 ✗ 5✗7 ✗

C (0) ✗ (2) ✗ 4 ✗ 6✗8

↖ (intersections

5 The equation $y = x^2 + 3x - 18$ is graphed on the set of axes below.

(handwritten:) The roots of an equation are the values of X when the graph crosses the x-axis. (The values of X when y = 0).

Based on this graph, what are the roots of the equation $x^2 + 3x - 18 = 0$?

(1) −3 and 6

(2) 0 and −18

(3) 3 and −6

(4) 3 and −18

6 What is an equation of the line that passes through $(-2,3)$ and $(6,-1)$?

(x_1, y_1) [handwritten above the problem, with (x, y)]

(1) $y = -\frac{1}{2}x + 2$ ⟵ *circled*

(x_2, y_2) [handwritten]

(2) $y = -\frac{1}{2}x + 4$

(3) $y = 2x + 7$ *positive slope*
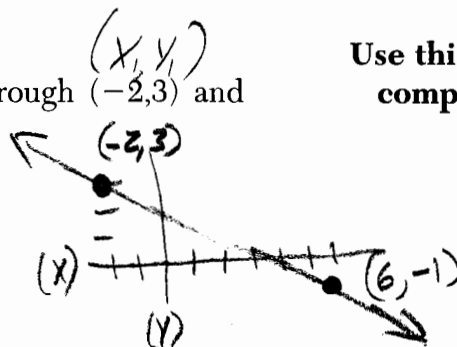
(4) $y = 2x - 1$ *positive slope*

y-intercept must be less than 3 [handwritten]

Check in graphing calculator [handwritten]

$y = -\frac{1}{2}x + 2$

X	Y
-2	3
0	2
2	1
4	0
6	-1 ✓

7 If each member of the data set {2,2,3,5,8} is multiplied by 2, which changes will take place in the mean, median, and mode of the data?

(1) The mean, median, and mode will be multiplied by 2. *circled*

(2) The median will remain the same; the mean and mode will be multiplied by 2.

(3) The mode will remain the same; the mean and median will be multiplied by 2.

(4) The mean will remain the same; the median and mode will be multiplied by 2.

$\{2, 2, 3, 5, 8\}$
$\{4, 4, 6, 10, 16\}$

	Mean	Median	Mode
{2,2,3,5,8}	4	3	2
{4,4,6,10,16}	8	6	4

8 Which characteristic of a cat is qualitative?   *not numerical* [handwritten]

(1) age   *# of years*

(2) color *circled*   *not a number* [handwritten]

(3) length   *# of inches*

(4) weight   *# of pounds*

9 What is the value of A in the following system of equations?

$3(2A + 3W = 12)$
$1(6A - 5W = 8)$

(1) 1

(2) 2

(3) 3 *circled*

(4) 9

[handwritten work:]
$6A + 9W = 36$
$(6A - 5W = 8)$
Subtract
$14W = 28$
$W = 2$ *substitute*

$2A + 3(W) = 12$
$2A + 3(2) = 12$
$2A + 6 = 12$
$2A = 6$
$A = 3$

10 A cell phone company is conducting a survey to determine the cell phone features that its customers use. Which survey is *least* biased?

(1) The company conducts the survey on teenagers.

(2) The company conducts the survey on all age groups.

(3) The company conducts the survey on retired females.

(4) The company conducts the survey on middle-aged males.

parallel lines have same slopes and different y-intercepts.

11 Which pair of linear equations represents parallel lines?

(1) $y = -\dfrac{1}{2}x + 4$
$y = 2x + 4$

(3) $y = 5x + 1$
$y = -5x + 7$

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

(4) $2x + y = 4$ $y = -2x + 4$
$y + 2x = 8$ $y = -2x + 8$

Same slopes Different y-intercepts

Choices 1, 2, and 3 have different slopes, so they cannot be parallel.

12 Which set of points does *not* represent a function?

(1) $\{(-3,-2),(-1,-2),(0,-1),(1,0)\}$

(2) $\{(-2,3),(0,4),(3,-2),(4,2)\}$

(3) $\{(2,-2),(1,4),(2,5),(3,6)\}$

(4) $\{(-2,4),(1,1),(2,4),(3,9)\}$
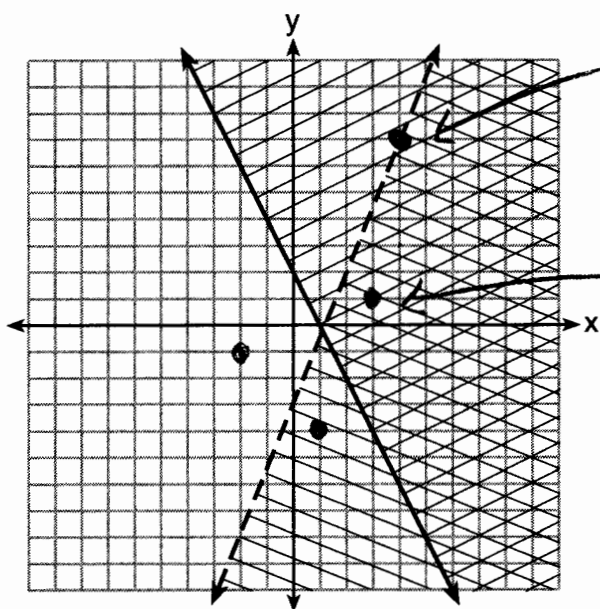
A function has one, and only one, value of y for every value of X.

In choice 3, when X = 2, there is more than one value of y. Therefore, choice 3 cannot be a function.

Integrated Algebra – June '16 [5] [OVER]

13 A system of inequalities is graphed on the set of axes below.

(4,7) lies on a dotted line, so it is not a solution

(3,1) solves both inequalities

The coordinates of a point in the solution of this system of inequalities are

(1) (4,7)   (3) (−2,−1)

(2) (1,−4)   (4) (3,1)

a=1 b=-4 c=10   *axis of symmetry* $= \dfrac{-b}{2a} = \dfrac{-(-4)}{2(1)} = \dfrac{4}{2}$

14 The axis of symmetry and the vertex of $y = x^2 - 4x + 10$ are

axis of symmetry : $X = 2$

(1) $x = 2$ and (2,6)   (3) $y = -2$ and (−2,6)   *check in graphing calculator*

(2) $y = 2$ and (2,6)   (4) $x = -2$ and (−2,6)

X	Y
0	10
1	7
2	6
3	7
4	10

Note Eliminate any choices where the equation of the axis of symmetry does not begin with X equals ....

15 What is the slope of the line whose equation is $4x = 3(y + 8)$?

(1) $\dfrac{4}{3}$ (3) $-\dfrac{4}{3}$

(2) $\dfrac{3}{4}$ (4) $-\dfrac{3}{4}$

$4x = 3(y+8)$

$4x = 3y + 24$

$4x - 24 = 3y$

$\dfrac{4}{3}x - \dfrac{24}{3} = y$

$y = mx + b$

slope

$y = \dfrac{4}{3}x - 8$
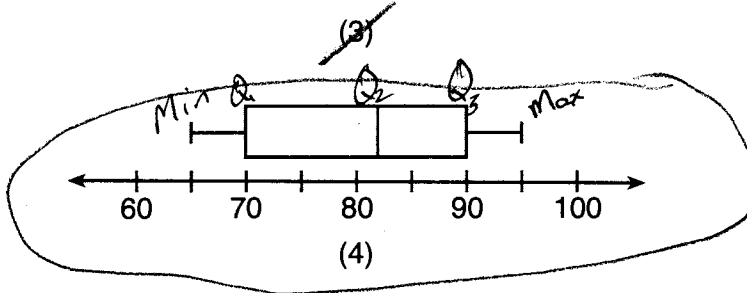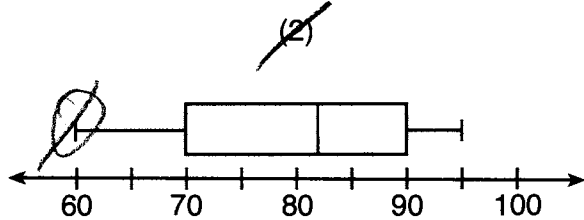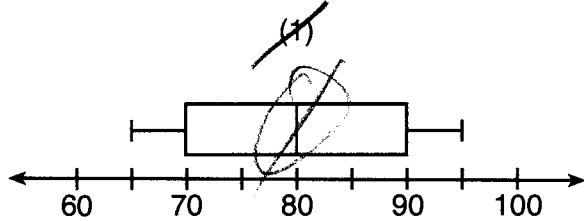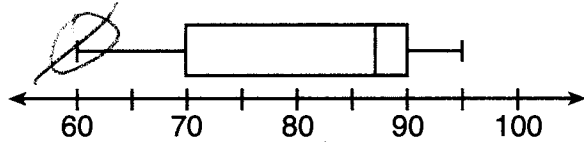
slope

16 The students in Ms. Glenn's math class earned the grades shown below. Min Q_1 Q_2 Q_3 Max

65, 70, 70, 80, 80, 82, 88, 88, 90, 90, 95

Which box-and-whisker plot represents these data?

(1)

(2)

(3)

(4)

17 When translated into symbols, "three less than half of a number" is

(1) $3 - \frac{1}{2}x$

(2) $\frac{1}{2}x - 3$

(3) $3 < \frac{1}{2}x$

(4) $\frac{1}{2}x < 3$

$-3 + \frac{1}{2}X$

$\frac{1}{2}X - 3$

18 An example of an algebraic expression is

(1) $6x - 2 \geq 4$

(2) $3x + 2y < -10$

(3) $(x - 4)(x - 1) = 6$
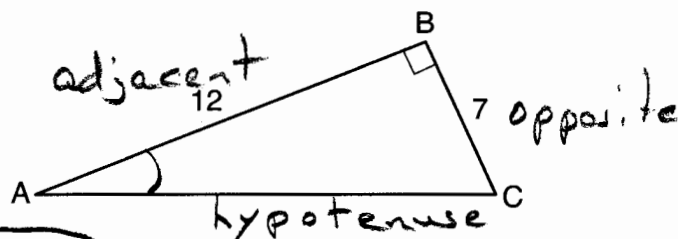
(4) $3x^2 - 10x - 3$

Expressions do __not__ have equal signs or inequality signs.

19 Which equation could be used to find the measure of one acute angle in the right triangle shown below?

adjacent 12

B

7 opposite

hypotenuse

A — C

$sin = \dfrac{opposite}{hypotenuse}$

$cos = \dfrac{adjacent}{hypotenuse}$

$tan = \dfrac{opposite}{adjacent}$

(1) $\tan A = \dfrac{7}{12}$ (circled)

(3) $\sin C = \dfrac{12}{7}$ (crossed out)

(2) $\tan A = \dfrac{12}{7}$

(4) $\cos A = \dfrac{7}{12}$ (crossed out)

Step 1.
The hypotenuse is not given, so eliminate choices (3) and (4).

Step 2.
$\tan A = \dfrac{opposite}{adjacent} = \dfrac{7}{12}$

20 Which interval notation describes the set $S = \{x | -5 < x \le 6\}$? Rules

(1) $[-5,6]$

(3) $[-5,6)$

(2) $(-5,6]$ (circled)

(4) $(-5,6)$

- Curved parentheses **do not** include the #.

- Square cornered parentheses **do** include the #.

the negative five is **not** included $-5 < X \le 6$ the six is included $(-5, \quad 6]$

21 Robert invests $800 in an account at 1.8% interest compounded annually. He will make no deposits or withdrawals on this account for 3 years. Which formula could be used to find the balance, A, in the account after the 3 years?

(1) $A = 800(1\ \_)^3$ (crossed out)

(3) $A = 800(1\ .018)^3$ (crossed out)

(2) $A = 800(1 + \_)^3$ (crossed out)

(4) $A = 800(1 + .018)^3$ (circled)

Exponential Growth

$A = P(1 + r)^t$

$P = 800$

$r = 1.8\% = .018$

$t = 3$

$A = 800(1 + .018)^3$

22 Which value of x is a solution of $-5x - 3 > -2x + 6$?

(1) -4 (circled)

(3) 3

(2) -3

(4) 0

Step 1 Solve

$-5x - 3 > -2x + 6$

$-5x + 2x - 3 > 6$

$-3x \quad -3 > 6$
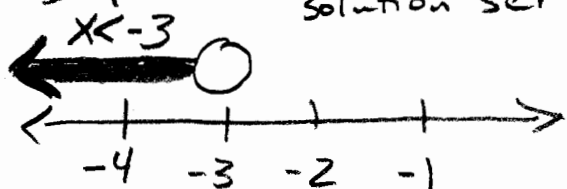
$-3x \quad\quad > 6 + 3$

$-3x \quad\quad > 9$

$\dfrac{-3x}{-3} < \dfrac{9}{-3}$

$x < -3$

Step 2 - Graph the solution set

$x < -3$

-4 -3 -2 -1

23 Given $W = \dfrac{V^2 t}{R}$, which expression can be used to represent t in terms of W, R, and V?

(1) $\dfrac{WR}{V^2}$ ⟵ circled

(2) $\dfrac{W}{RV^2}$

(3) $\dfrac{W}{R} - V^2$

(4) $WR - V^2$

Handwritten: $W = \dfrac{V^2 t}{R}$; $RW = V^2 t$; $\dfrac{RW}{V^2} = t$
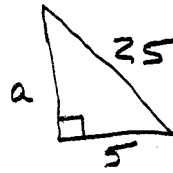
24 The longest side of a right triangle is 25. If one of the other sides is 5, which measure is the length of the missing side?

(1) $5\sqrt{26}$

(2) $10\sqrt{6}$ ⟵ circled

(3) 30

(4) 60

Handwritten (hypotenuse): $a^2 + b^2 = c^2$; $a^2 + 5^2 = 25^2$; $a^2 + 25 = 625$; $a^2 = 600$; $a = \sqrt{600}$; $a = \sqrt{100}\sqrt{6}$; $a = 10\sqrt{6}$

25 Which statement is correct?

(1) $(2b^3 c^5)(-3b^2 c) = -6b^5 c^6$ ⟵ crossed out

(2) $\dfrac{6m^3 t^8}{-2m^5 t^3} = \dfrac{-3t^5}{m^2}$ ⟵ circled

(3) $(-5n^4 q)^2 = 25n^8 q^2$ ⟵ crossed out

(4) $\dfrac{t^3}{v^5} \div \dfrac{v}{t} = \dfrac{t^2}{v^2}$ ⟵ crossed out

Handwritten: $\dfrac{t^3}{v^5} \times \dfrac{t}{v} = \dfrac{t^4}{v^6}$

26 What value of x would make the expression $\dfrac{x}{2x+1}$ undefined?

(1) 0

(2) $-\dfrac{1}{2}$ ⟵ circled

(3) -1

(4) $\dfrac{1}{2}$

Handwritten: A rational expression is undefined when the denominator = zero. $2x+1 = 0$; $2x = -1$; $x = -\dfrac{1}{2}$

27 Written in factored form, the binomial $a^2 - 16b^2$ is equivalent to

(1) $(a - 4b)(a + 4b)$ ⟵ circled

(2) $(a - 4b)(a - 4b)$

(3) $(a - 8b)(a + 8b)$

(4) $(a - 8b)(a - 8b)$
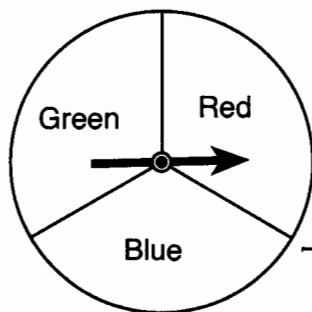
Handwritten (Difference of Perfect Squares): $a^2 - b^2 = (a+b)(a-b)$; $a^2 - 16b^2 = (a+4b)(a-4b)$

28 A spinner is divided into three equal regions, as shown in the diagram below. Ray spun the spinner six times and recorded his results: red, blue, blue, green, red, red.

(handwritten) (Outcomes)

(handwritten spinner diagram with Green, Red, Blue)

(handwritten)
Red
Blue
Green

	Theoretical Probability	Emperical Probability
	$\frac{2}{6}$	$\frac{3}{6}$
	$\frac{2}{6}$	$\frac{2}{6}$
	$\frac{2}{6}$	$\frac{1}{6}$

Which statement is true about the outcomes of blue in Ray's experiment?

(1) The empirical probability was less than the theoretical probability.

(2) The empirical probability was greater than the theoretical probability.

(3) The empirical and theoretical probabilities were equal.

(4) The empirical and theoretical probabilities were unrelated.

29 Liem is 6 feet 2 inches, Eli is 5 feet 9 inches, Faith is 6 feet, and Simon is 5 feet 4 inches. In *yards*, what is the total of their heights?

(1) $7\frac{3}{4}$

(2) $7\frac{16}{36}$

(3) $22\frac{15}{36}$

(4) $23\frac{1}{4}$

(handwritten table)

	Feet	Inches
Liem	6	2
Eli	5	9
Faith	6	0
Simon	5	4
Total	22 ft	15 in.
	23 ft	3 in.
7 yds	2 ft	3 in
7 yds	0 ft	27 in
$7\frac{27}{36}$ yds	0 ft	0 in
$7\frac{3}{4}$ yds	Simplify	

30 The sum of $\frac{x}{2a}$ and $\frac{2x}{3a}$ is

(1) $\frac{3x}{5a}$

(2) $\frac{3x}{6a}$

(3) $\frac{7x}{6a}$

(4) $\frac{2x^2}{6a^2}$

(handwritten)
$\left(\frac{3}{3}\right)\frac{x}{2a} + \frac{2x}{3a}\left(\frac{2}{2}\right)$

$\frac{3x}{6a} + \frac{4x}{6a}$

$\frac{7x}{6a}$

Answer all 3 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [6]

measured   *actual*

31 Jim calculated the area of a triangle to be 51.75 cm^2. The actual area of the triangle is 53.24 cm^2 Find the relative error in Jim's calculation of the area to the *nearest thousandth*.

$$\text{Relative Error} = \left| \frac{\text{actual} - \text{measured}}{\text{actual}} \right|$$

$$= \left| \frac{51.75 - 53.24}{53.24} \right|$$

$$= \left| \frac{-1.49}{53.24} \right|$$

$$= .0279864763$$

tenths hundredths thousandths
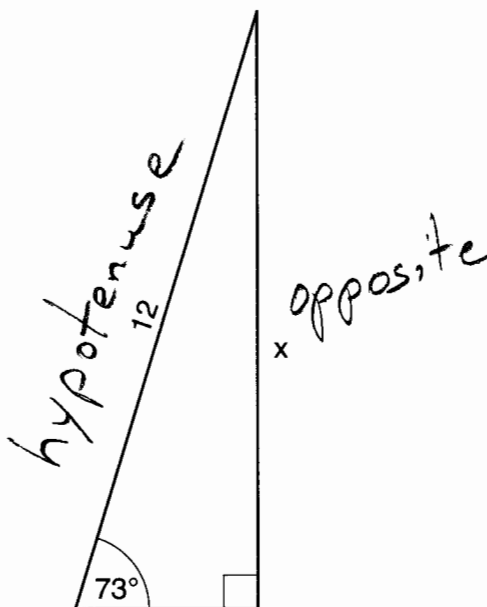
Answer $\boxed{.028}$

32 A 12 foot ladder is placed against a wall. The ladder makes an angle of 73° with the floor. Determine, to the *nearest tenth of a foot*, how high up the wall the ladder will reach.

SOH
CAH
TOA

$sin = \dfrac{opposite}{hypotenuse}$

$sin \, 73° = \dfrac{X}{12}$

$12(sin \, 73°) = X$
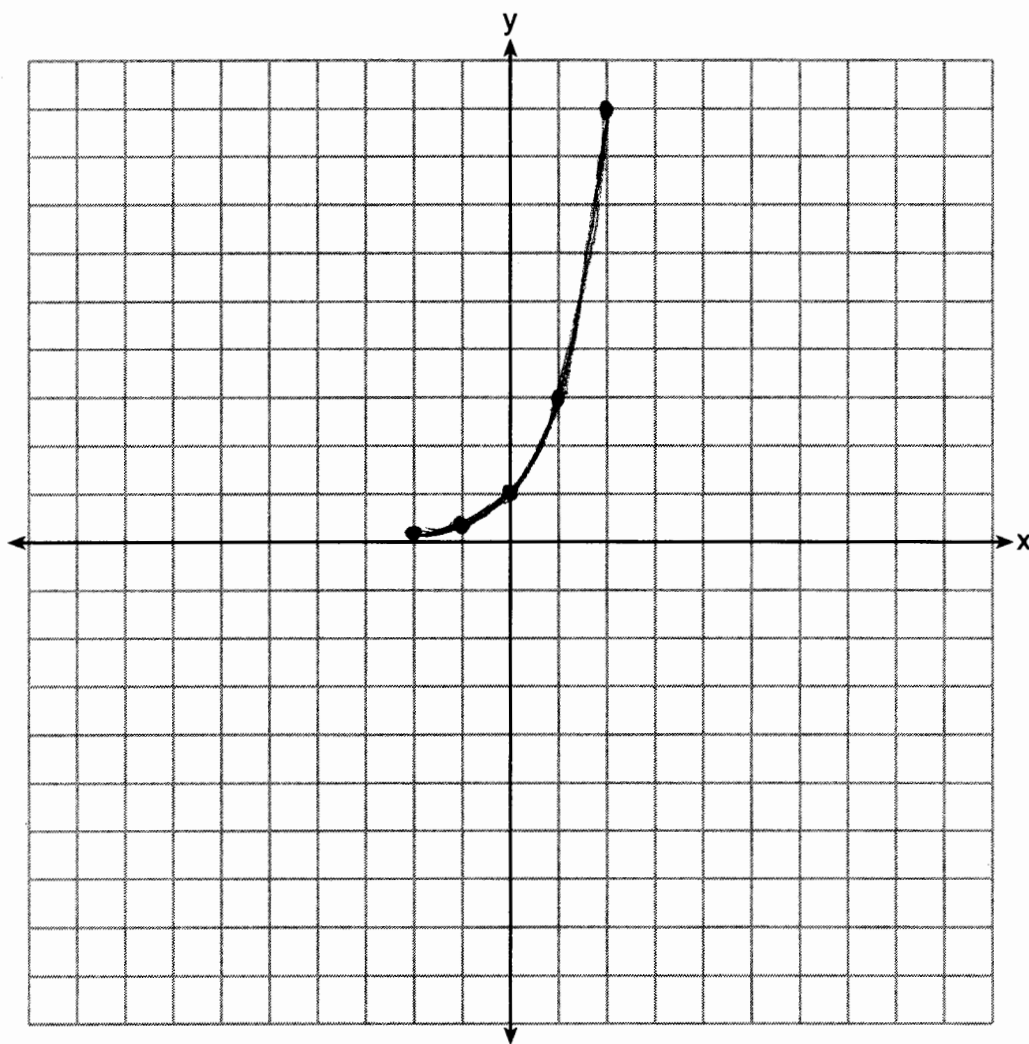
$11.475657707 = X$

tenths   hundredths

nearest tenth

$\boxed{11.5 \; feet}$ answer

33 On the set of axes below, draw the graph of the function $y = 3^x$. Include the interval $-2 \le x \le 2$.

Step 1   Put $y = 3^x$ in graphing calculator

Step 2   Inspect graph and copy table of values for interval $-2 \le x \le 2$.

X	Y
-2	.1111
-1	.3333
0	1
1	3
2	9

Step 3
Plot the graph

Part III

Answer all 3 questions in this part. Each correct answer will receive 3 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [9]

34 Ryan bought three bags of mixed tulip bulbs at a local garden store. The first bag contained 7 yellow bulbs, 8 red bulbs, and 5 white bulbs. The second bag contained 3 yellow bulbs, 11 red bulbs, and 6 white bulbs. The third bag contained 13 yellow bulbs, 2 red bulbs, and 5 white bulbs. Ryan combined the contents of these three bags into a single container. He randomly selected one bulb, planted it, and then randomly selected another and planted that one. Determine if it is <u>more likely that Ryan planted a red bulb and then another red bulb</u>, or <u>planted a yellow bulb and then a white bulb</u>. Justify your answer.

	Yellow	Red	White	Totals
Bag 1	7	8	5	20
Bag 2	3	11	6	20
Bag 3	13	2	5	20
Totals	23	21	16	60

$$P_{(a+b)} = P_{(a)} \cdot P_{(b)}$$

$$P_{(red+red)} = \left(\frac{21}{60}\right)\left(\frac{20}{59}\right) = \frac{420}{(60)(59)} \quad \leftarrow \begin{array}{l} \text{Bigger} \\ \text{Numerator} \\ \text{Same} \\ \text{Denominator} \end{array}$$
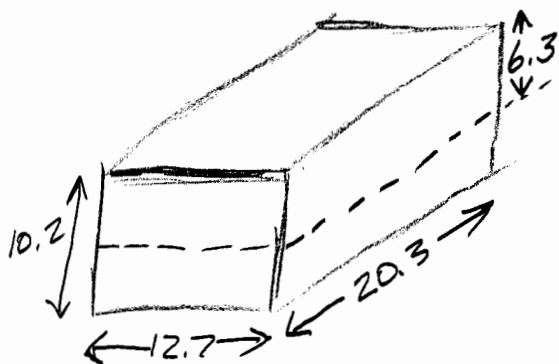
$$P_{(yellow+white)} = \left(\frac{23}{60}\right)\left(\frac{16}{59}\right) = \frac{368}{(60)(59)} \quad \leftarrow \begin{array}{l} \text{Smaller} \\ \text{Numerator} \\ \text{Same} \\ \text{Denominator} \end{array}$$

Answer

Red followed by red is more likely.

35 A particular jewelry box is in the shape of a rectangular prism. The box is advertised as having an interior length of 20.3 centimeters, an interior width of 12.7 centimeters, and an interior height of 10.2 centimeters. However, when a customer measures the interior of the box, she finds that the interior height is actually 6.3 centimeters. Upon further examination, she discovers that the bottom of the interior of the box lifts up to reveal a hidden compartment. Find the volume of this hidden compartment to the *nearest cubic centimeter*.

Note

Assume that the top of the hidden compartment has zero thickness.

$$V = \ell w h$$

$$V = (20.3)(12.7)(10.2 - 6.3)$$

$$V = (20.3)(12.7)(3.9)$$

$$V = 1005.459$$

nearest cubic centimeter

$$V = \boxed{1005}$$

answer

36 Solve algebraically for all values of x that satisfy the equation: $\dfrac{x}{x+4} = \dfrac{3}{x+2}$

① Cross multiply
$$\frac{x}{x+4} = \frac{3}{x+2}$$

② Use Distributive Property
$$x(x+2) = 3(x+4)$$

③ Gather terms in left expression
$$x^2 + 2x = 3x + 12$$

④ Simplify
$$x^2 + 2x - 3x - 12 = 0$$

⑤ Factor
$$x^2 - x - 12 = 0$$
$$(x-4)(x+3) = 0$$

⑥ Multiplication property of zero

| $x - 4 = 0$ | $x + 3 = 0$ |

⑦ answers

| $\boxed{x = 4}$ | $\boxed{x = -3}$ |

Check $x = 4$
$$\frac{4}{4+4} = \frac{3}{4+2}$$
$$\frac{4}{8} = \frac{3}{6}$$
$$\frac{1}{2} = \frac{1}{2} \checkmark$$

$x = -3$
$$\frac{-3}{-3+4} = \frac{3}{-3+2}$$
$$\frac{-3}{1} = \frac{3}{-1}$$
$$-3 = -3 \checkmark$$

Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [12]
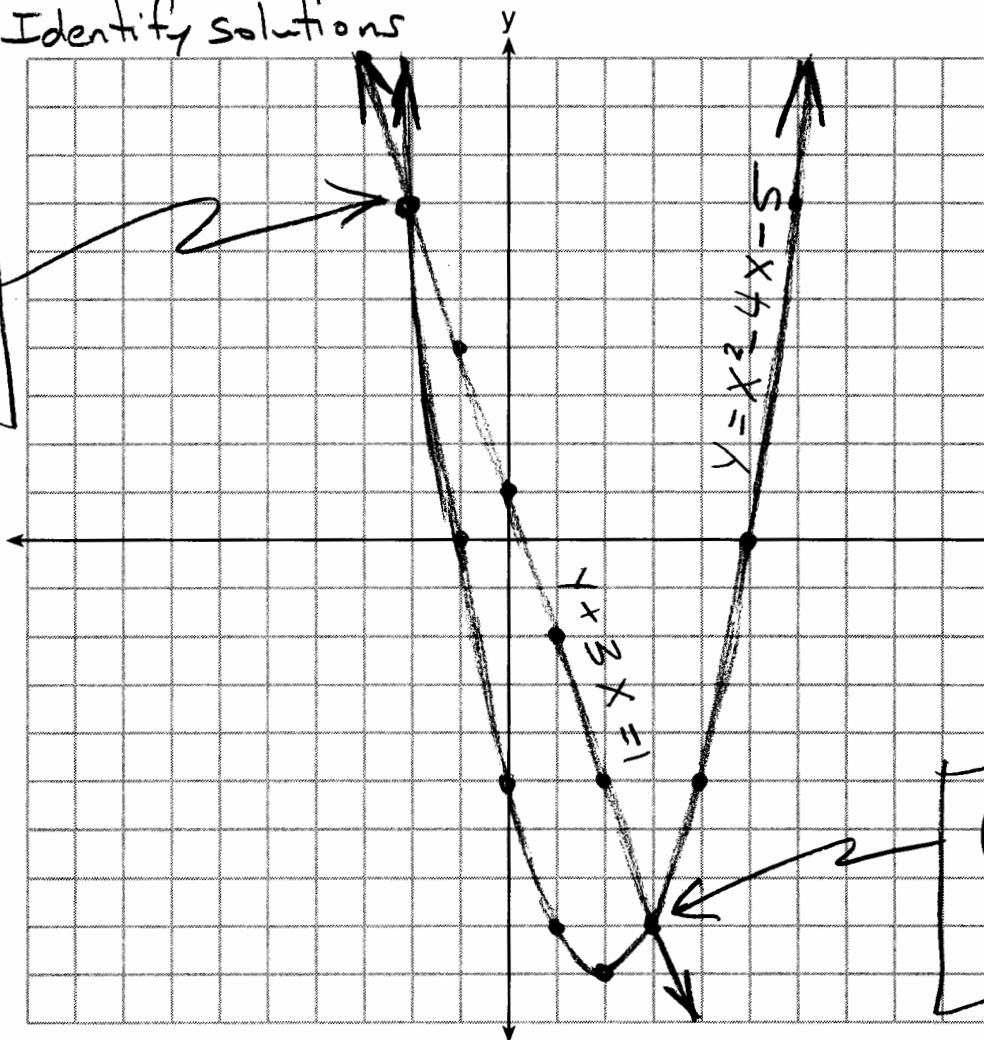
37 On the set of axes below, <u>solve</u> the following system of equations <u>graphically</u> for all values of x and y. <u>State the coordinates of all solutions.</u>

$$y = x^2 - 4x - 5$$
$$y + 3x = 1$$

Step 1 — Put both equations in graphing calculator $\Rightarrow Y = -3X + 1$

Step 2 — Inspect graph and copy table of values

Step 3 — Plot graphs

Step 4 — Identify solutions

(-2, 7) Solution

(3, -8) Solution

X	Y₁	Y₂
-2	7	7
-1	0	4
0	-5	1
1	-8	-2
2	-9	-5
3	-8	-8
4	-5	-1
5	0	
6	7	

$y = x^2 - 4x - 5$

$y + 3x = 1$

→ division

38 Express in simplest form: $\dfrac{x^2+5x+6}{x^2-x-20} \div \dfrac{x^2+x-6}{2x-10}$

Step 1
Change to a multiplication problem

→ multiplication

$$\frac{x^2+5x+6}{x^2-x-20} \times \frac{2x-10}{x^2+x-16}$$

} inverted

Step 2
Factor everything and cancel.

$$\frac{[(x+3)(x+2)][(2)(x-5)]}{[(x-5)(x+4)][(x+3)(x-2)]}$$

Step 3
Simplify what is left.

$$\frac{(x+2)(2)}{(x+4)(x-2)}$$

$$\boxed{\dfrac{2x+4}{x^2+2x-8}}$$

answer

39 The length of a rectangle is $(3\sqrt{8} + 2)$ and the width is $(2\sqrt{2} + 1)$.

Express the perimeter of the rectangle in simplest radical form.

$$P = 2(l+w)$$
$$P = 2(3\sqrt{8} + 2 + 2\sqrt{2} + 1)$$
$$P = 2(3\sqrt{4}\sqrt{2} + 2 + 2\sqrt{2} + 1)$$
$$P = 2(3 \cdot 2\sqrt{2} + 2 + 2\sqrt{2} + 1)$$
$$P = 2(6\sqrt{2} + 2\sqrt{2} + 2 + 1)$$
$$P = 2(8\sqrt{2} + 3)$$
$$P = \boxed{16\sqrt{2} + 6} \quad \text{answer}$$

Express the area of the rectangle in simplest radical form.

$$A = lw$$
$$A = (3\sqrt{8} + 2)(2\sqrt{2} + 1)$$
$$A = (3\sqrt{8} \cdot 2\sqrt{2}) + (3\sqrt{8} \cdot 1) + (2 \cdot 2\sqrt{2}) + (2 \cdot 1)$$
$$A = (6\sqrt{16}) + (3 \cdot \sqrt{8}) + (4\sqrt{2}) + (2)$$
$$A = (6 \cdot 4) + (3\sqrt{4}\sqrt{2}) + (4\sqrt{2}) + (2)$$
$$A = 24 + (3 \cdot 2\sqrt{2}) + (4\sqrt{2}) + (2)$$
$$A = 24 + 6\sqrt{2} + 4\sqrt{2} + 2$$
$$A = \boxed{26 + 10\sqrt{2}} \quad \text{answer}$$