1. 060501a, P.I. A.N.7
Jeremy's bedroom has two doors leading into the hallway. His house has four doors leading to the outside. Using the doorways, in how many different ways can Jeremy leave his room and go outside?

[A] 8 [B] 4 [C] 5 [D] 6

2. 060502a, P.I. 7.A.6
The amount of time, *t*, in seconds, it takes an object to fall a distance, *d*, in meters, is expressed by the formula $t = \sqrt{\frac{d}{4.9}}$.

Approximately how long will it take an object to fall 75 meters?

[A] 0.26 sec [B] 3.9 sec

[C] 7.7 sec [D] 2.34 sec

3. 060503a, P.I. A.N.1
Which equation illustrates the distributive property?

[A] $a + 0 = a$ [B] $a + b = b + a$

[C] $a + (b + c) = (a + b) + c$

[D] $5(a + b) = 5a + 5b$

4. 060504a, P.I. 7.N.5
The mass of an orchid seed is approximately 0.0000035 gram. Written in scientific notation, that mass is equivalent to 3.5×10^n. What is the value of *n*?

[A] -6 [B] -7 [C] -8 [D] -5

5. 060505a, P.I. A.A.26
A cake recipe calls for 1.5 cups of milk and 3 cups of flour. Seth made a mistake and used 5 cups of flour. How many cups of milk should he use to keep the proportions correct?

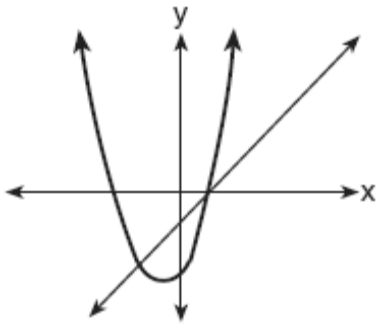
[A] 2.5 [B] 2.25 [C] 2 [D] 1.75

6. 060506a, P.I. A.A.14
When $3x^2 - 6x$ is divided by $3x$, the result is

[A] $-2x$ [B] $x - 2$

[C] $2x$ [D] $x + 2$

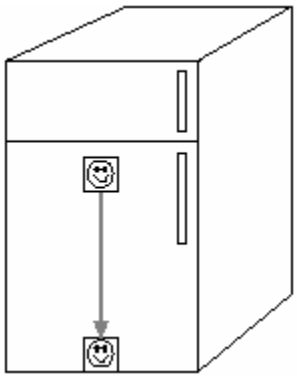
7. 060507a
The accompanying diagram shows the graphs of a linear equation and a quadratic equation.



How many solutions are there to this system of equations?

[A] 0 [B] 1 [C] 3 [D] 2

8. 060508a, P.I. G.G.56
A picture held by a magnet to a refrigerator slides to the bottom of the refrigerator, as shown in the accompanying diagram.



This change of position is an example of a

[A] dilation [B] translation

[C] rotation [D] reflection

9. 060509a, P.I. 6.S.5
Jorge made the accompanying stem-and-leaf plot of the weights, in pounds, of each member of the wrestling team he was coaching.

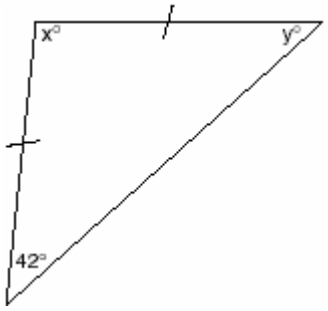
Stem	Leaf						
10	9						
11							
12	3	8					
13	2	4	4	6	8		
14	1	3	5	5	9		
15	2	3	7	7	9		
16	1	3	7	8	8	8	9
17	3	8					

Key: 16 | 1 = 161

What is the mode of the weights?

[A] 152 [B] 150 [C] 168 [D] 145

10. 060510a, P.I. G.G.31
Tina wants to sew a piece of fabric into a scarf in the shape of an isosceles triangle, as shown in the accompanying diagram.



What are the values of *x* and *y*?

[A] $x = 42$ and $y = 96$

[B] $x = 90$ and $y = 48$

[C] $x = 96$ and $y = 42$

[D] $x = 69$ and $y = 69$

11. 060511a, P.I. A.A.13
The expression $(x^2 - 5x - 2) - (-6x^2 - 7x - 3)$ is equivalent to

[A] $7x^2 - 2x + 1$ [B] $7x^2 + 2x - 5$

[C] $7x^2 - 12x - 5$ [D] $7x^2 + 2x + 1$

12. 060512a, P.I. A.N.3
The expression $\sqrt{50} + \sqrt{32}$ is equivalent to

[A] $\sqrt{82}$ [B] 6 [C] $9\sqrt{2}$ [D] 18

13. 060513a, P.I. A.A.22
If $7x + 2a = 3x + 5a$, then *x* is equivalent to

[A] $\frac{3a}{4}$ [B] $\frac{3a}{10}$ [C] $\frac{7a}{10}$ [D] $\frac{7a}{4}$

14. 060514a, P.I. A.A.27
What is the solution set of the equation $x^2 + 11x + 28 = 0$?

[A] {-7,4} [B] {-3,-4}

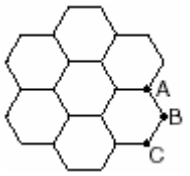
[C] {-7,-4} [D] {3,4}

15. 060515a, P.I. G.G.33
Which set could *not* represent the lengths of the sides of a triangle?

[A] {5,10,12} [B] {7,9,11}

[C] {3,4,5} [D] {2,5,9}

16. 060516a, P.I. G.G.37
The accompanying figure represents a section of bathroom floor tiles shaped like regular hexagons.



What is the measure of angle *ABC*?

[A] 60° [B] 90°

[C] 150° [D] 120°

17. 060517a, P.I. G.G.25
The statement "If *x* is prime, then it is odd" is false when *x* equals

[A] 2 [B] 3 [C] 1 [D] 4

18. 060518a, P.I. A.A.12

If $x \neq 0$, then $\frac{(x^2)^3}{x^5} \cdot 1000$ is equivalent to

[A] $1000x$ [B] 0

[C] $1000 + x$ [D] 1000

19. 060519a, P.I. A.A.6

If $-2x + 3 = 7$ and $3x + 1 = 5 + y$, the value of y is

[A] 0 [B] 10 [C] 1 [D] -10

20. 060520a, P.I. G.G.26

What is the converse of the statement "If it is Sunday, then I do not go to school"?

[A] If it is not Sunday, then I do not go to school.

[B] If I do not go to school, then it is Sunday.

[C] If it is not Sunday, then I go to school.

[D] If I go to school, then it is not Sunday.

21. 060521a, P.I. A.A.34

If point (-1,0) is on the line whose equation is $y = 2x + b$, what is the value of b?

[A] 0 [B] 2 [C] 3 [D] 1

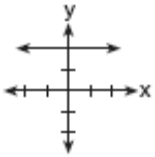
22. 060522a, P.I. A.N.6

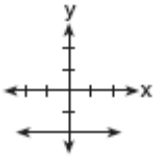
If r = 2 and s = -7, what is the value of $|r| - |s|$?

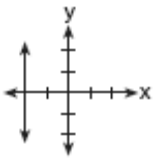
[A] -9 [B] -5 [C] 9 [D] 5

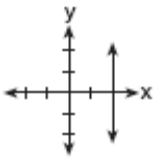
23. 060523a, P.I. A.A.36

Which graph represents the equation $x = 2$?

[A] 

[B] 

[C] 

[D] 

24. 060524a, P.I. G.G.45

On a scale drawing of a new school playground, a triangular area has sides with lengths of 8 centimeters, 15 centimeters, and 17 centimeters. If the triangular area located on the playground has a perimeter of 120 meters, what is the length of its longest side?

[A] 51 m [B] 40 m

[C] 45 m [D] 24 m

25. 060525a, P.I. 7.N.11

If a and b are both odd integers, which expression must always equal an odd integer?

[A] $a \cdot b$ [B] $a - b$ [C] $a + b$ [D] $\frac{a}{b}$

26. 060526a, P.I. G.G.39

Which quadrilateral must have diagonals that are congruent and perpendicular?

[A] square [B] trapezoid

[C] parallelogram [D] rhombus

27. 060527a, P.I. A.G.1

The length of a side of a square window in Jessica's bedroom is represented by $2x - 1$. Which expression represents the area of the window?

[A] $2x^2 + 1$ [B] $4x^2 + 1$

[C] $4x^2 + 4x - 1$ [D] $4x^2 - 4x + 1$

28. 060528a, P.I. G.G.63

Which equation represents a line that is perpendicular to the line whose equation is $-2y = 3x + 7$?

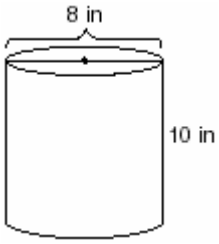
[A] $y = \frac{2}{3}x - 3$ [B] $2y = 3x - 3$

[C] $y = x + 7$ [D] $y = \frac{3}{2}x - 3$

29. 060529a, P.I. A.S.23
The probability that the Cubs win their first game is $\frac{1}{3}$. The probability that the Cubs win their second game is $\frac{3}{7}$. What is the probability that the Cubs win both games?

[A] $\frac{16}{21}$ [B] $\frac{1}{7}$ [C] $\frac{6}{7}$ [D] $\frac{2}{5}$

30. 060530a, P.I. A.G.2
A storage container in the shape of a right circular cylinder is shown in the accompanying diagram.



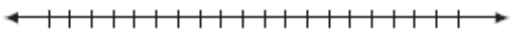
What is the volume of this container, to the *nearest hundredth*?

[A] 251.33 in^3 [B] 125.66 in^3

[C] 502.65 in^3 [D] 56.55 in^3

31. 060531a, P.I. A.A.7
A ribbon 56 centimeters long is cut into two pieces. One of the pieces is three times longer than the other. Find the lengths, in centimeters, of both pieces of ribbon.

32. 060532a, P.I. 8.G.19
The manufacturer of Ron's car recommends that the tire pressure be at least 26 pounds per square inch and less than 35 pounds per square inch. On the accompanying number line, graph the inequality that represents the recommended tire pressure.



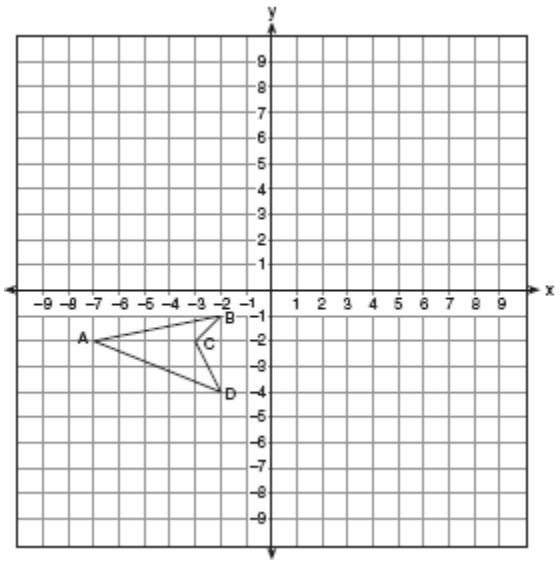
33. 060533a, P.I. A.RP.11
In a survey of 400 teenage shoppers at a large mall, 240 said they shopped at Abernathy's, 210 said they shopped at Bongo Republic, and 90 said they shopped at both stores. How many of the teenage shoppers surveyed did not shop at either store?

34. 060534a, P.I. A2.S.11
An algebra class of 21 students must send 5 students to meet with the principal. How many different groups of 5 students could be formed from this class?

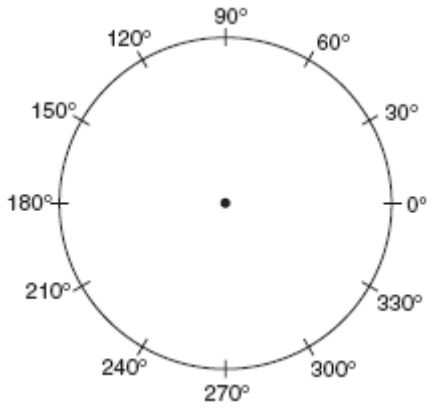
35. 060535a, P.I. A.A.20
Factor completely: $3x^2 + 15x - 42$

36. 060536a, P.I. A.A.8
Mr. James wanted to plant a garden that would be in the shape of a rectangle. He was given 80 feet of fencing to enclose his garden. He wants the length to be 10 feet more than twice the width. What are the dimensions, in feet, for a rectangular garden that will use exactly 80 feet of fencing?

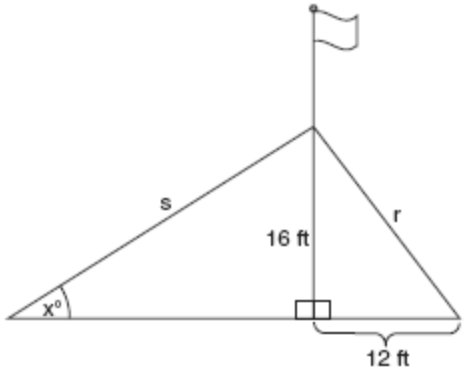
37. 060537a, P.I. G.G.54
On the accompanying set of axes, draw the reflection of *ABCD* in the *y*-axis. Label and state the coordinates of the reflected figure.



38. 060538a, P.I. 7.S.2
In a class of 24 students, 10 have brown hair, 8 have black hair, 4 have blond hair, and 2 have red hair. On the accompanying diagram, construct a circle graph to show the students' hair color.



39. 060539a, P.I. A.A.43
The accompanying diagram shows a flagpole that stands on level ground. Two cables, *r* and *s*, are attached to the pole at a point 16 feet above the ground. The combined length of the two cables is 50 feet. If cable *r* is attached to the ground 12 feet from the base of the pole, what is the measure of the angle, *x*, to the *nearest degree*, that cable *s* makes with the ground?



[1] A

[2] B

[3] D

[4] A

[5] A

[6] B

[7] D

[8] B

[9] C

[10] C

[11] D

[12] C

[13] A

[14] C

[15] D

[16] D

[17] A

[18] A

[19] D

[20] B

[21] B

[22] B

[23] D

[24] A

[25] A

[26] A

[27] D

[28] A

[29] B

[30] C

[31]
[2] 14 and 42, and appropriate work is shown, such as $x + 3x = 56$, a table, or trial and error with at least three trials and appropriate checks.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but only one of the two lengths is found.
or [1] A correct equation is written and solved, but the lengths are not stated.
or [1] An incorrect equation of equal difficulty is solved appropriately.
or [1] 14 and 42, but no work or fewer than three trials with appropriate checks are shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[32]
[2] A correct graph is drawn on the number line, with a closed circle at the left end and an open circle at the right end.
[1] Appropriate work is shown, but one graphing error is made, such as writing an incorrect scale on the number line.
or [1] Appropriate work is shown, but one conceptual error is made, such as using a closed circle instead of an open circle.
or [1] A correct inequality is written, but the graph is not drawn.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[2] 40, and appropriate work is shown, such as a Venn diagram or (240 + 210) - 90 = 360 and 400 - 360 = 40.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] 40, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[33]

[2] 20,349, and appropriate work is shown, such as ${}_{21}C_5 = 20{,}349$.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made, such as determining the value of ${}_{21}P_5$.
or [1] 20,349, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[34]

[2] $3(x + 7)(x - 2)$, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] A conceptual error is made, such as incomplete factoring.
or [1] $3(x + 7)(x - 2)$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[35]

[3] 10 and 30, and appropriate work is shown, such as $2x + 2(2x + 10) = 80$ or trial and error with at least three trials and appropriate checks.
[2] Appropriate work is shown, but one computational error is made.
or [2] Appropriate work is shown, but only one of the dimensions is found.
or [2] The trial-and-error method is used to find a correct solution, but only two trials and appropriate checks are shown.
[1] Appropriate work is shown, but two or more computational errors are made.
or [1] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.
or [1] An incorrect equation of equal difficulty is solved appropriately.
or [1] Appropriate solutions are found based on the incorrect use of the perimeter formula, such as $3x + 10 = 80$.
or [1] 10 and 30, but no work or only one trial with an appropriate check is shmvn.
[0] 10 or 30, but no work or only one trial with an appropriate check is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[36]

[3] The figure is drawn accurately and the new coordinates are labeled and stated as J'(7,-2), B'(2,-1), C'(3,-2), and D'(2,-4).
[2] One error is made in drawing the figure, such as misplotting one point, but the new coordinates are labeled and stated appropriately, based on that figure.
or [2] The figure is drawn and labeled accurately, but the new coordinates are not stated or are stated incorrectly.
or [2] The new coordinates are labeled and stated correctly, but the figure is not drawn.
[1] Two errors are made in drawing the reflected figure, but the new coordinates are labeled and stated appropriately, based on that figure.
or [1] Appropriate work is shown, but one conceptual error is made, such as reflecting the figure in the x-axis or the origin.
or [1] Correct points are plotted and labeled, but the figure is not drawn, and the coordinates are not stated.
or [1] The figure is drawn correctly, but the new coordinates are not labeled or stated.
[0] An appropriate reflection in the x-axis is drawn, and the coordinates are not labeled or stated.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[37]

[4]A correct circle graph is drawn and labeled, and appropriate work is shown, such as using proportions. [A correct graph will show 150° for brown, 120° for black, 60° for blond, and 30° for red.]
[3] Appropriate work is shown, but one computational error is made, but an appropriate graph is drawn.
or [3] Appropriate work is shown, but one graphing error is made.
or [3] Appropriate work is shown and a correct graph is drawn, but the sectors are not labeled or are labeled incorrectly.
[2] Appropriate work is shown, but two or more computational errors are made, but an appropriate graph is drawn.
or [2] Appropriate work is shown, but one conceptual error is made.
or [2] Correct numbers of degrees or correct proportional values are found, but two or more graphing errors are made.
or [2] Correct numbers of degrees or correct proportional values are found, but no graph is drawn.
or [2] A correct circle graph is drawn and labeled, but no work is shown.
[1] Appropriate work is shown and a graph is drawn, but two or more computational errors and two or more graphing errors are made.
or [1] At least two numbers of degrees or proportional values are found correctly, but no graph or an incorrect graph is drawn.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[38]

[4] 32, and appropriate work is shown, such as $12^2 + 16^2 = r^2$, $50 - r = s$, and $\sin x = \frac{16}{30}$.
[3] Appropriate work is shown, but one computational error is made.
or [3] Appropriate work is shown to find r = 20 and s = 30 and the trigonometric equation $\sin x = \frac{16}{30}$ is written, but it is not solved or is solved incorrectly.
[2] Appropriate work is shown, but two or more computational errors are made.
or [2] Appropriate work is shown, but one conceptual error is made, such as using an incorrect trigonometric function to find the angle.
or [2] The lengths of rand s are found correctly, but no further correct work is shown.
or [2] Incorrect lengths are found for rand s, but the sine function is used correctly to find an appropriate angle.
[1] Appropriate work is shown, but one conceptual error and one computational error are made.
or [1] The length of r is found correctly, but no further correct work is shown.
or [1] 32, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[39]