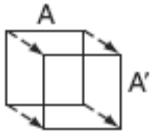
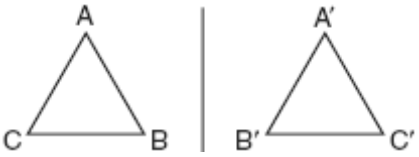
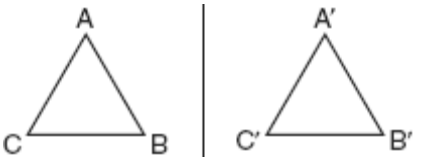
1. 010601a, P.I. A.A.22
What is the value of x in the equation $5(2x-7)=15x-10$?

[A] -5 [B] -9 [C] 0.6 [D] 1

2. 010602a, P.I. G.G.56
Ms. Brewer's art class is drawing reflected images. She wants her students to draw images reflected in a line. Which diagram represents a correctly drawn image?

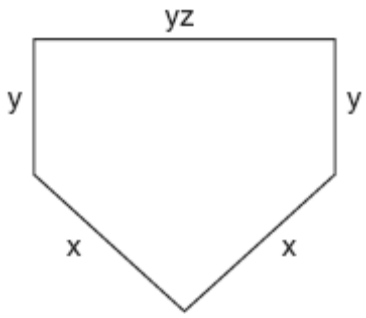
[A] 

[B] 

[C] 

[D] 

3. 010603a, P.I. A.G.1
The lengths of the sides of home plate in a baseball field are represented by the expressions in the accompanying figure.



Which expression represents the perimeter of the figure?

[A] $2x+3yz$ [B] $2x+2y+yz$

[C] $5xyz$ [D] x^2+y^3z

4. 010604a, P.I. A.A.1
Which expression represents "5 less than the product of 7 and x"?

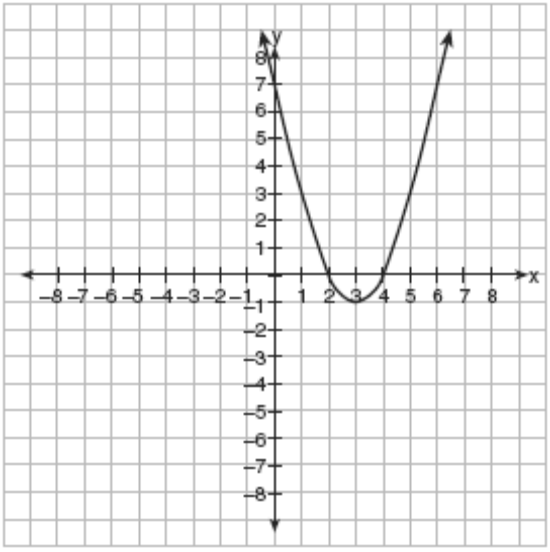
[A] $5-7x$ [B] $7+x-5$

[C] $7x-5$ [D] $7(x-5)$

5. 010605a
What is the y-intercept of the graph of the line whose equation is $y=-\frac{2}{5}x+4$?

[A] $-\frac{2}{5}$ [B] 0 [C] $-\frac{5}{2}$ [D] 4

6. 010606b, P.I. A.G.10
Which is an equation of the line of symmetry for the parabola in the accompanying diagram?

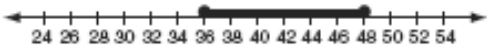


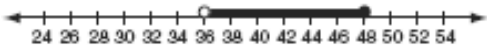
[A] $x = 4$ [B] $x = 3$
[C] $y = 3$ [D] $x = 2$

7. 010607a, P.I. A.A.15
For which value of x will the fraction $\frac{3}{2x+4}$ be undefined?
[A] -4 [B] 2 [C] 0 [D] -2

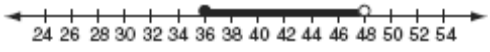
8. 010608a, P.I. A.G.1
The equation $A = \frac{1}{2}(12)(3+7)$ is used to find the area of a trapezoid. Which calculation would *not* result in the correct area?
[A] $\frac{12}{2} \times \frac{10}{2}$ [B] $\frac{12(3+7)}{2}$
[C] $0.5(12)(10)$ [D] $6(3+7)$

9. 010609a, P.I. 7.N.5
The size of a certain type of molecule is 0.00009078 inch. If this number is expressed as 9.078×10^n, what is the value of n?
[A] 8 [B] -5 [C] -8 [D] 5

10. 010610a, P.I. 8.G.19
In order to be admitted for a certain ride at an amusement park, a child must be greater than or equal to 36 inches tall and less than 48 inches tall. Which graph represents these conditions?
[A] 

[B] 

[C] 

[D] 

11. 010611a, P.I. 7.S.6
The accompanying circle graph shows how Shannon earned $600 during her summer vacation.

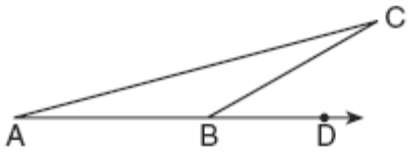
What is the measure of the central angle of the section labeled "Chores"?
[A] 30° [B] 60° [C] 90° [D] 120°

12. 010612a, P.I. A2.S.9
Robin has 8 blouses, 6 skirts, and 5 scarves. Which expression can be used to calculate the number of different outfits she can choose, if an outfit consists of a blouse, a skirt, and a scarf?

[A] ${}_{19}C_3$ [B] $8 \cdot 6 \cdot 5$

[C] $8!6!5!$ [D] $8+6+5$

13. 010613a, P.I. G.G.31
In the accompanying diagram of ΔABC, $\overline{AB}$ is extended through D, $m\angle CBD = 30$, and $\overline{AB} \cong \overline{BC}$.



What is the measure of $\angle A$?

[A] 150° [B] 30° [C] 15° [D] 75°

14. 010614a, P.I. G.G.54
The image of point (-2,3) under translation T is (3,-l). What is the image of point (4,2) under the same translation?

[A] (9,-2) [B] (-1,6)

[C] (0,7) [D] (5,4)

15. 010615a, P.I. G.G.48
A builder is building a rectangular deck with dimensions of 16 feet by 30 feet. To ensure that the sides form 90° angles, what should each diagonal measure?

[A] 30 ft [B] 46 ft [C] 34 ft [D] 16 ft

16. 010616a, P.I. G.G.26
Which statement is the inverse of "If the waves are small, I do not go surfing"?

[A] If I do not go surfing, the waves are small.

[B] If the waves are not small, I go surfing.

[C] If the waves are not small, I do not go surfing.

[D] If I go surfing, the waves are not small.

17. 010617a, P.I. A.G.1
A dog is tied with a rope to a stake in the ground. The length of the rope is 5 yards. What is the area, in square yards, in which the dog can roam?

[A] 25 [B] 25π [C] 10π [D] 20

18. 010618a, P.I. 6.S.5
Melissa's test scores are 75, 83, and 75. Which statement is true about this set of data?

[A] mean = median [B] mode < median

[C] mean < mode [D] mode = median

19. 010619a, P.I. A.A.13
When $3a^2 - 7a + 6$ is subtracted from $4a^2 - 3a + 4$, the result is

[A] $-a^2 - 4a + 2$ [B] $a^2 - 10a - 2$

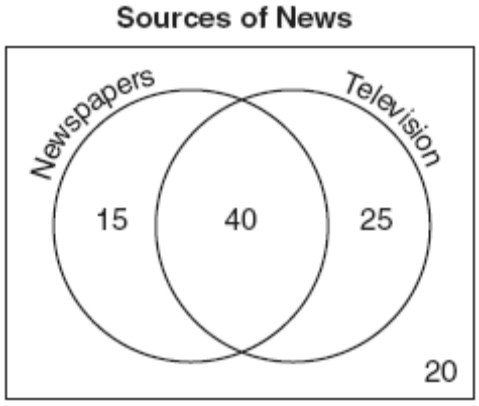
[C] $a^2 + 4a - 2$ [D] $7a^2 - 10a + 10$

20. 010620a, P.I. A.A.23
In the equation $A = p + prt$, t is equivalent to

[A] $\frac{A - pr}{p}$ [B] $\frac{A}{P} - pr$

[C] $\frac{A}{pr} - p$ [D] $\frac{A - p}{pr}$

21. 010621a, P.I. A.RP.11
The accompanying Venn diagram shows the results of a survey asking 100 people if they get news by reading newspapers or by watching television.



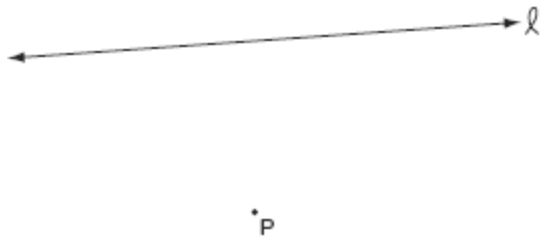
What is the probability that a person selected at random from this survey does *not* claim television as a source of getting the news?

[A] $\frac{15}{100}$ [B] $\frac{35}{100}$ [C] $\frac{75}{100}$ [D] $\frac{55}{100}$

22. 010622a, P.I. A.N.3
The expression $\frac{6\sqrt{20}}{3\sqrt{5}}$ is equivalent to

[A] 8 [B] $3\sqrt{15}$ [C] $2\sqrt{15}$ [D] 4

23. 010623a, P.I. G.G.22
In the accompanying diagram, point *P* lies 3 centimeters from line ℓ.



How many points are both 2 centimeters from line ℓ and 1 centimeter from point *P*?

[A] 1 [B] 2 [C] 0 [D] 4

24. 010624a, P.I. 8.G.3
The ratio of two supplementary angles is 3:6. What is the measure of the *smaller* angle?

[A] 30° [B] 20° [C] 60° [D] 10°

25. 010625a
Which point is on the circle whose equation is $x^2 + y^2 = 289$?

[A] (-12,12) [B] (-1,-16)
[C] (7,-10) [D] (8,-15)

26. 010626a, P.I. A.N.5
The Edison Lightbulb Company tests 5% of their daily production of lightbulbs. If 500 bulbs were tested on Tuesday, what was the total number of bulbs produced that day?

[A] 25 [B] 1,000
[C] 10,000 [D] 100,000

27. 010627a, P.I. G.G.26
Which statement is expressed as a biconditional?

[A] Two angles are congruent if and only if they have the same measure.

[B] If two angles are congruent, then they are both right angles.

[C] Two angles are congruent if they have the same measure.

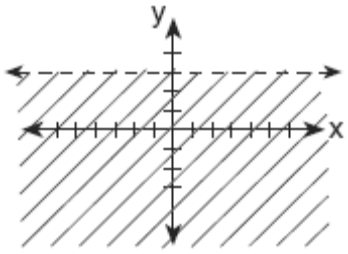
[D] If two angles are both right angles, then they are congruent.

28. 010628a, P.I. A2.S.9
A committee of five members is to be randomly selected from a group of nine freshmen and seven sophomores. Which expression represents the number of different committees of three freshmen and two sophomores that can be chosen?

[A] ${}_{16}C_3 \cdot {}_{16}C_2$ [B] ${}_9P_3 \cdot {}_7P_2$

[C] ${}_9C_3 \cdot {}_7C_2$ [D] ${}_9C_3 + {}_7C_2$

29. 010629a, P.I. A.G.6
Which inequality is represented by the accompanying graph?



[A] $y > 3$ [B] $y \geq 3$

[C] $y < 3$ [D] $y \leq 3$

30. 010630a, P.I. A.N.1
Which equation illustrates the multiplicative inverse property?

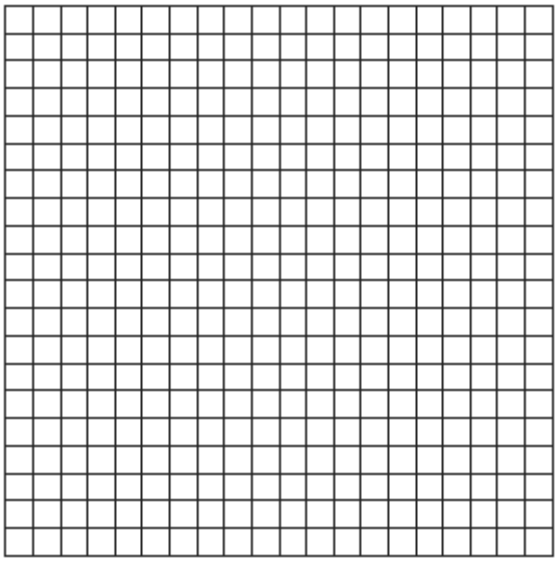
[A] $1 \cdot 0 = 0$ [B] $-1 \cdot x = -x$

[C] $1 \cdot x = x$ [D] $x \cdot \frac{1}{x} = 1$

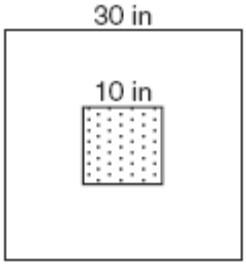
31. 010631a, P.I. A.A.16
Simplify: $\frac{x^2 + 6x + 5}{x^2 - 25}$

32. 010632a, P.I. 7.N.2
Write an irrational number and explain why it is irrational.

33. 010633a
In a circle whose center is (2,3), one endpoint of a diameter is (-1,5). Find the coordinates of the other endpoint of that diameter. [The use of the accompanying grid is optional.]



34. 010634a, P.I. A2.S.13
The accompanying diagram shows a square dartboard. The side of the dartboard measures 30 inches. The square shaded region at the center has a side that measures 10 inches. If darts thrown at the board are equally likely to land anywhere on the board, what is the theoretical probability that a dart does *not* land in the shaded region?

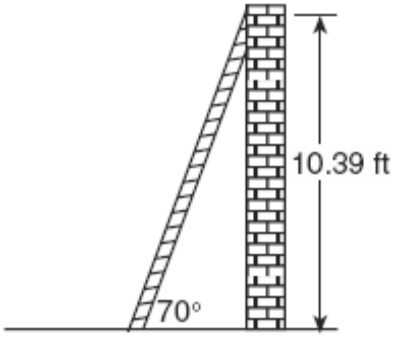


35. 010635a, P.I. A.A.6
A candy store sells 8-pound bags of mixed hazelnuts and cashews. If c pounds of cashews are in a bag, the price p of the bag can be found using the formula $p = 2.59c + 1.72(8 - c)$. If one bag is priced at \$18.11, how many pounds of cashews does it contain?

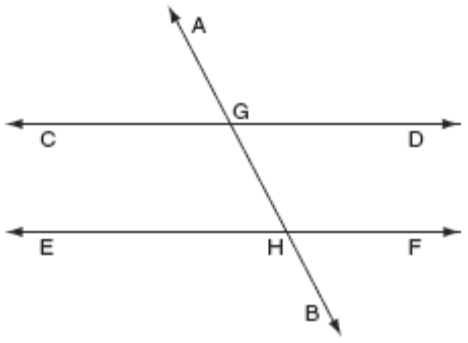
36. 010636a, P.I. A.A.22
Solve for x: $\frac{1}{16}x + \frac{1}{4} = \frac{1}{2}$

37. 010637a, P.I. A.A.27
Solve for x: $x^2 + 2x - 24 = 0$

38. 010638a, P.I. A.A.44
As shown in the accompanying diagram, a ladder is leaning against a vertical wall, making an angle of 70° with the ground and reaching a height of 10.39 feet on the wall. Find, to the *nearest foot*, the length of the ladder. Find, to the *nearest foot*, the distance from the base of the ladder to the wall.



39. 010639a, P.I. 8.A.12
In the accompanying diagram, $\overleftrightarrow{CD} \parallel \overleftrightarrow{EF}$, $\overleftrightarrow{AB}$ is a transversal, $m\angle DGH = 2x$, and $m\angle FHB = 5x - 51$. Find the measure, in degrees, of $\angle BHE$.



[1] A

[2] B

[3] B

[4] C

[5] D

[6] B

[7] D

[8] A

[9] B

[10] D

[11] B

[12] B

[13] C

[14] A

[15] C

[16] B

[17] B

[18] D

[19] C

[20] D

[21] B

[22] D

[23] A

[24] C

[25] D

[26] C

[27] A

[28] C

[29] C

[30] D

[31] [2] $\frac{x+1}{x-5}$, and appropriate work is shown.
[1] Only one expression is factored correctly, such as $(x + 5)(x + 1)$ or $(x + 5)(x - 5)$, but an appropriate simplification is done.
[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] An irrational number is written, and an appropriate explanation is written, such as an irrational number cannot be written as a fraction or as a repeating or terminating decimal.
[1] An irrational number is written, such as π or the square root of a nonperfect square, but no explanation or an inappropriate explanation is written.
or [1] A correct definition of an irrational number is written, but the example is missing or is inappropriate.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[2] (5,1), and appropriate work is shown, such as a graph using the slope or $2=\frac{x-1}{2}$ and $3=\frac{y+5}{2}$.
[1] Both (2,3) and (-1,5) are plotted correctly, but one graphing error is made in finding the other endpoint.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] Appropriate work is shown, but only x = 5 or y = 1 is found.
or [1] Appropriate work is shown, and the correct endpoint is designated, but the coordinates are not stated.
or [1] (5,1), 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] $\frac{800}{900}$ or an equivalent answer, and appropriate work is shown, such as finding the areas of the two squares, subtracting the area of the smaller square from the area of the larger square, and setting up a correct ratio.
[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 calculating the perimeters of the squares instead of the areas.
or [1] Appropriate work is shown, but $\frac{100}{900}$ or an equivalent answer (the complement of the correct answer) is found.
or [1] The areas of the squares are calculated incorrectly, but an appropriate probability is found.
or [1] $\frac{800}{900}$ or an equivalent answer, but no work is shown.
[0] The areas of the squares are calculated correctly, but no probability is 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.

[34]

[2] 5 and appropriate work is shown, such as substituting \$18.11 for *p* and solving the equation correctly, 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 one conceptual error is made.
or [1] 5, 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.

[35]

[3] 4, and appropriate work is shown.
[2] Appropriate work is shown, but one computational error is made.
[1] Appropriate work is shown, but two or more computational errors are made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] 4, 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.

[36]

[3] -6 and 4, and appropriate work is shown, such as factoring 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 correct value for x is found.
or [2] The trial-and-error method is used to find the correct solutions, but only two trials and appropriate checks are shown.
[1] Appropriate work is shown, but two or more computational errors are made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] The equation is factored correctly, but no values are found.
or [1] The equation is factored incorrectly, but two appropriate values are found.
or [1] -6 and 4, but no work or only one trial with an appropriate check is shown.
[0] -6 or 4, 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.

[37]

[4] Length of ladder =11 and distance from the base of the ladder to the wall = 4, and appropriate work is shown, such as using sine and then tangent or the Pythagorean theorem.
[3] Appropriate work is shown, but one computational or rounding error is made.
or [3] Appropriate work is shown, but the correct answers are not labeled or are labeled incorrectly.
[2] Appropriate work is shown, but two or more computational or rounding errors are made.
or [2] Appropriate work is shown, but one conceptual error is made, such as using one incorrect trigonometric ratio.
or [2] Appropriate work is shown, but only the length of the ladder or the distance from the base of the ladder to the wall is found.
or [2] Two correct trigonometric equations are written, but no further correct work is shown.
[1] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.
or [1] Only one correct trigonometric equation is written, and no further correct work is shown.
or [1] Length of ladder = 11 and distance from the base of the ladder to the wall = 4, but no work is shown.
[0] Length of ladder = 11 or distance from the base of the ladder to the wall = 4, but no work is shown.
or [0] 11 and 4, but no work is shown, and the solutions are not labeled.
or [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] 146, and appropriate work is shown, such as solving the equation $2x = 5x - 51$.
[3] Appropriate work is shown, but one computational error is made.
or [3] The measure of $\angle FHB$ or $\angle DGH$ is found to be 34, and appropriate work is shown, but no further correct work is shown.
[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 solving the equation $2x + 5x - 51 = 180$.
or [2] The correct equation is solved for $x = 17$, but no further correct work is shown.
[1] Appropriate work is shown, but one conceptual error and one computational error are made.
or [1] The correct equation is written, but no further correct work is shown.
or [1] 146, 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]