

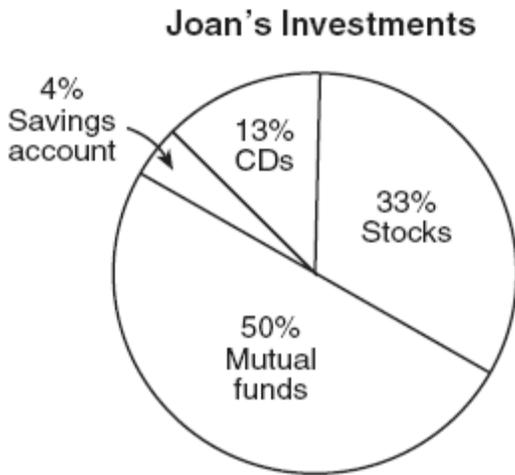
1. 080701a, P.I. G.G.25

Given the true statements: " $t$  is a multiple of 3" and " $t$  is even." What could be a value of  $t$ ?

- [A] 24    [B] 9    [C] 8    [D] 15

2. 080702a, P.I. 7.S.6

The accompanying circle graph shows how Joan invested her money.

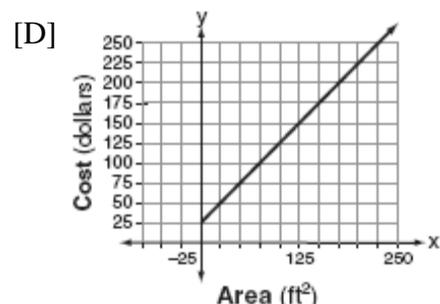
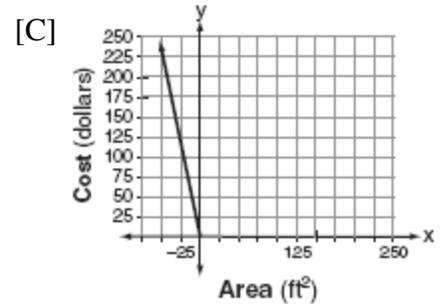
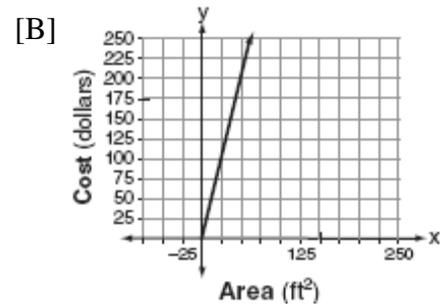
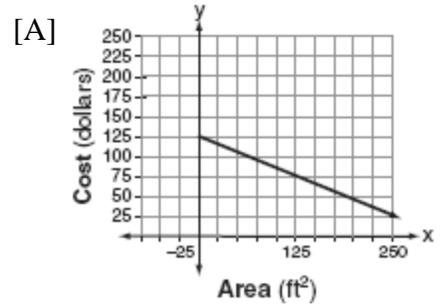


If she invested a total of \$12,000, how much money did she invest in CDs?

- [A] \$1,560                      [B] \$92,308  
[C] \$9,230                      [D] \$15,600

3. 080703a, P.I. A.G.4

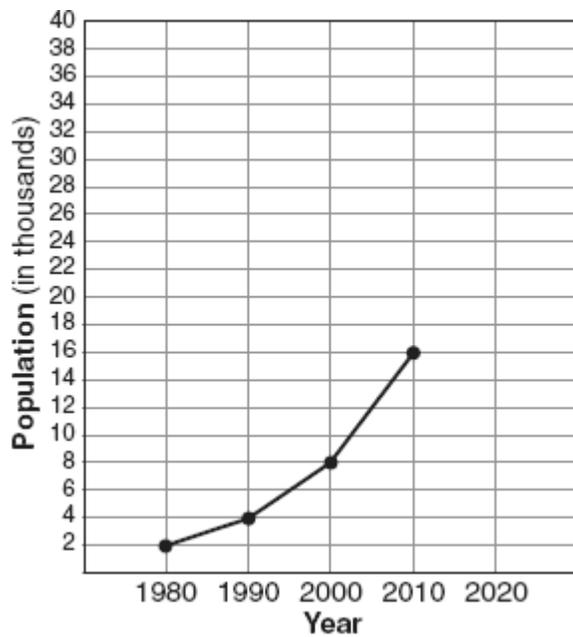
Super Painters charges \$1.00 per square foot plus an additional fee of \$25.00 to paint a living room. If  $x$  represents the area of the walls of Francesca's living room, in square feet, and  $y$  represents the cost, in dollars, which graph best represents the cost of painting her living room?



4. 080704a, P.I. A2.S.9  
Jen and Barry's ice cream stand has three types of cones, six flavors of ice cream, and four kinds of sprinkles. If a serving consists of a cone, one flavor of ice cream, and one kind of sprinkles, how many different servings are possible?

[A] 90 [B] 72 [C]  ${}_{13}C_3$  [D]  ${}_{13}P_3$

5. 080705a, P.I. A2.S.7  
The population growth of Boomtown is shown in the accompanying graph.



If the same pattern of population growth continues, what will the population of Boomtown be in the year 2020?

[A] 64,000 [B] 40,000  
[C] 20,000 [D] 32,000

6. 080706a, P.I. A.A.10  
If  $a + 3b = 13$  and  $a + b = 5$ , the value of  $b$  is
- [A] 7 [B] 1 [C] 4 [D] 4.5

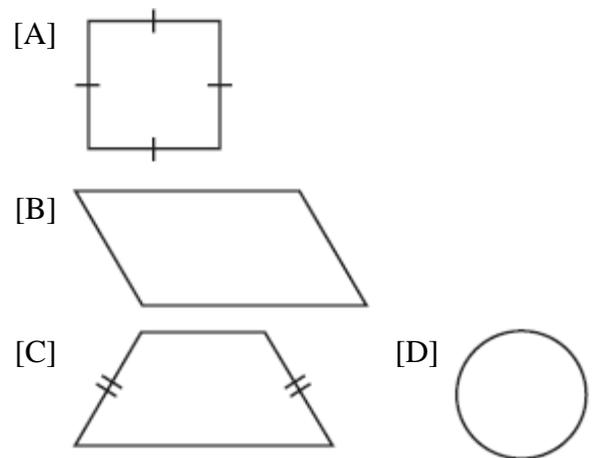
7. 080707a, P.I. A.A.45  
A cable 20 feet long connects the top of a flagpole to a point on the ground that is 16 feet from the base of the pole. How tall is the flagpole?

[A] 12 ft [B] 26 ft [C] 8 ft [D] 10 ft

8. 080708a, P.I. A.A.22  
In the equation  $\frac{1}{4}n + 5 = 5\frac{1}{2}$ ,  $n$  is equal to

[A] 8 [B]  $\frac{1}{8}$  [C]  $\frac{1}{2}$  [D] 2

9. 080709a  
Which geometric shape does *not* have any lines of symmetry?



10. 080710a, P.I. A.A.13  
The sum of  $8x^2 - x + 4$  and  $x - 5$  is

[A]  $8x^2 - 2x - 1$  [B]  $8x^2 - 1$   
[C]  $8x^2 + 9$  [D]  $8x^2 - 2x + 9$

11. 080711a, P.I. A.A.19  
One factor of the expression  $x^2y^2 - 16$  is

[A]  $x^2 + 8$  [B]  $x^2 - 4$   
[C]  $xy - 4$  [D]  $xy - 8$

12. 080712a, P.I. A.N.3

What is the sum of  $\sqrt{50}$  and  $\sqrt{8}$ ?

- [A]  $\sqrt{58}$                       [B]  $29\sqrt{2}$   
[C]  $7\sqrt{2}$                       [D]  $9\sqrt{2}$

13. 080713a, P.I. G.G.54

What are the coordinates of point  $(2, -3)$  after it is reflected over the  $x$ -axis?

- [A]  $(-2, 3)$                       [B]  $(-3, 2)$   
[C]  $(2, 3)$                       [D]  $(-2, -3)$

14. 080714a, P.I. 6.S.5

The accompanying stem-and-leaf plot represents Ben's test scores this year.

6	5	8				
7	2	3	3	3	3	9
8	1	3	3	6	7	
9	6	9	9			

Key: 7 | 2 = 72

What is the median score for this set of data?

- [A] 79      [B] 81      [C] 80      [D] 73

15. 080715a, P.I. 7.N.5

The video of the movie *Star Wars* earned \$193,500,000 in rental fees during its first year. Expressed in scientific notation, the number of dollars earned is

- [A]  $193.5 \times 10^6$                       [B]  $1.935 \times 10^6$   
[C]  $1935 \times 10^8$                       [D]  $1.935 \times 10^8$

16. 080716a, P.I. A.A.1

In the Ambrose family, the ages of the three children are three consecutive even integers. If the age of the youngest child is represented by  $x + 3$ , which expression represents the age of the oldest child?

- [A]  $x + 5$                       [B]  $x + 6$   
[C]  $x + 7$                       [D]  $x + 8$

17. 080717a, P.I. 7.N.3

If  $t < \sqrt{t}$ ,  $t$  could be

- [A] 0      [B]  $\frac{1}{2}$       [C] 2      [D] 4

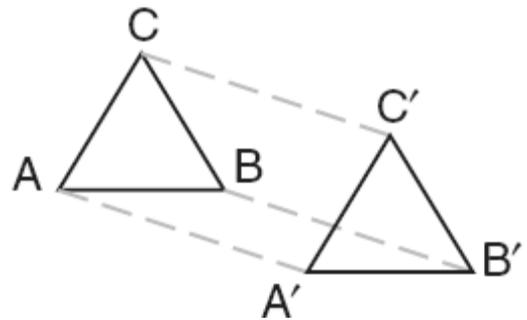
18. 080718a, P.I. 7.N.2

Which number is irrational?

- [A]  $0.\bar{3}$       [B]  $\sqrt{121}$       [C]  $\pi$       [D]  $\frac{5}{4}$

19. 080719a, P.I. G.G.56

In the accompanying diagram,  $\Delta A'B'C'$  is the image of  $\Delta ABC$  and  $\Delta A'B'C' \cong \Delta ABC$ .



Which type of transformation is shown in the diagram?

- [A] rotation                      [B] translation  
[C] line reflection                      [D] dilation

20. 080720a, P.I. A2.S.11

The expression  ${}_8C_3$  is equivalent to

- [A]  ${}_8P_3$       [B]  ${}_8P_5$       [C]  ${}_8C_5$       [D]  $\frac{8!}{3!}$

21. 080721a, P.I. G.G.56  
The accompanying diagram shows the starting position of the spinner on a board game.

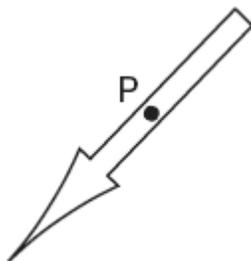


How does this spinner appear after a  $270^\circ$  counterclockwise rotation about point  $P$ ?

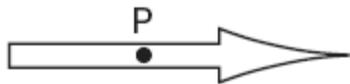
[A]



[B]



[C]



[D]



22. 080722a, P.I. A.A.23  
Which equation is equivalent to  $3x + 4y = 15$ ?

[A]  $y = 15 - 3x$       [B]  $y = 3x - 15$

[C]  $y = \frac{3x - 15}{4}$       [D]  $y = \frac{15 - 3x}{4}$

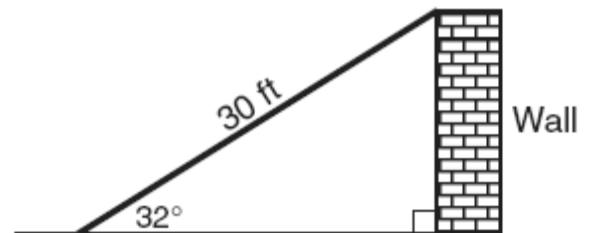
23. 080723a  
When graphed on the coordinate plane, the equations  $y = 2x^2 + 4x + 5$  and  $x^2 + y^2 = 36$  form

[A] a parabola and a straight line

[B] a parabola and a circle

[C] two circles      [D] two parabolas

24. 080724a, P.I. A.A.44  
The accompanying diagram shows a ramp 30 feet long leaning against a wall at a construction site.



If the ramp forms an angle of  $32^\circ$  with the ground, how high above the ground, to the nearest tenth, is the top of the ramp?

[A] 56.6 ft      [B] 15.9 ft

[C] 18.7 ft      [D] 25.4 ft

25. 080725a, P.I. A.N.1  
Which equation illustrates the associative property?

[A]  $a(b + c) = (ab) + (ac)$

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

[C]  $a(1) = a$       [D]  $a + b = b + a$

26. 080726a, P.I. G.G.67  
What is the length of the line segment that joins the points whose coordinates are (4,7) and (-3,5)?

[A]  $\sqrt{193}$                       [B]  $3\sqrt{6}$   
[C]  $\sqrt{5}$                          [D]  $\sqrt{53}$

27. 080727a, P.I. A2.S.10  
Which expression represents the number of different 8-letter arrangements that can be made from the letters of the word "SAVANNAH" if each letter is used only once?

[A]  ${}_8P_5$     [B]  $\frac{8!}{3!2!}$     [C]  $8!$     [D]  $\frac{8!}{5!}$

28. 080728a  
Line segment  $AB$  has a slope of  $\frac{3}{4}$ . If the coordinates of point  $A$  are (2,5), the coordinates of point  $B$  could be

[A] (6,2)                      [B] (6,8)  
[C] (5,9)                      [D] (-1,1)

29. 080729a, P.I. G.G.45  
Which is *not* a property of all similar triangles?

[A] The altitudes are in the same ratio as the corresponding sides.  
[B] The perimeters are in the same ratio as the corresponding sides.  
[C] The corresponding sides are congruent.  
[D] The corresponding angles are congruent.

30. 080730a, P.I. A2.A.8  
The expression  $(\frac{3}{4})^2 \cdot (\frac{1}{4})^{-2}$  is equivalent to

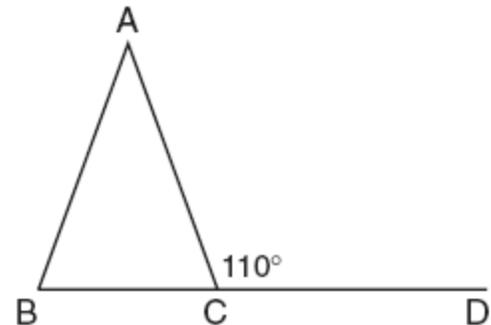
[A]  $\frac{9}{16}$     [B] 3    [C] 9    [D]  $\frac{9}{256}$

31. 080731a, P.I. A.A.22  
Solve for  $x$ :  $5(x-2) = 2(10+x)$

32. 080732a, P.I. A.A.6  
Thelma and Laura start a lawn-mowing business and buy a lawnmower for \$225. They plan to charge \$15 to mow one lawn. What is the *minimum* number of lawns they need to mow if they wish to earn a profit of *at least* \$750?

33. 080733a, P.I. A.A.27  
What is the positive solution of the equation  $4x^2 - 36 = 0$ ?

34. 080734a, P.I. G.G.31  
In the accompanying diagram of isosceles triangle  $ABC$ ,  $\overline{AB} \cong \overline{AC}$ , and exterior angle  $ACD = 110^\circ$ . What is  $m\angle BAC$ ?

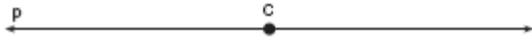


35. 080735a, P.I. G.G.39  
In rhombus  $ABCD$ , the measure, in inches, of  $\overline{AB}$  is  $3x+2$  and  $\overline{BC}$  is  $x+12$ . Find the number of inches in the length of  $\overline{DC}$ .

36. 080736a, P.I. A.M.1  
The trip from Manhattan to Montauk Point is 120 miles by train or by car. A train makes the trip in 2 hours, while a car makes the trip in  $2\frac{1}{2}$  hours. How much faster, in miles per hour, is the average speed of the train than the average speed of the car?

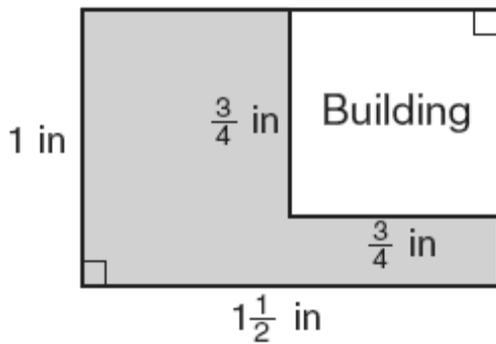
37. 080737a, P.I. G.G.22

In the diagram below, town  $C$  lies on straight road  $p$ . Sketch the points that are 6 miles from town  $C$ . Then sketch the points that are 3 miles from road  $p$ . How many points satisfy both conditions?



38. 080738a, P.I. A.G.1

The accompanying diagram represents a scale drawing of the property where Brendan's business is located. He needs to purchase rock salt to melt the ice on the parking lot (shaded area) around his building. A bag of rock salt covers an area of 1,500 square feet. How many bags of rock salt does Brendan need to purchase to salt the entire parking lot?



Scale:  $\frac{1}{4}$  in = 18 ft

39. 080739a, P.I. G.G.26

Given the statement: "If I live in Albany, then I am a New Yorker."

In the spaces provided below, write the inverse, the converse, and the contrapositive of this statement.

Inverse: \_\_\_\_\_

\_\_\_\_\_

Converse: \_\_\_\_\_

\_\_\_\_\_

Contrapositive: \_\_\_\_\_

\_\_\_\_\_

Which conditional is logically equivalent to its original statement?

inverse      converse      contrapositive

- [1] A
- [2] A
- [3] D
- [4] B
- [5] D
- [6] C
- [7] A
- [8] D
- [9] B
- [10] B
- [11] C
- [12] C
- [13] C
- [14] C
- [15] D
- [16] C
- [17] B
- [18] C
- [19] B
- [20] C
- [21] C
- [22] D
- [23] B
- [24] B
- [25] B
- [26] D
- [27] B
- [28] B

- [29] C
- [30] C

[2] 10, and appropriate work is shown, such as solving the equation 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] 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] 10, but no work or fewer than three trials and 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

- [31] incorrect procedure.

[2] 65, and appropriate work is shown, such as solving the inequality  $15x \geq 225 + 750$  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] 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] 65, but no work or fewer than three trials and 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

- [32] incorrect procedure.

[2] 3, and appropriate work is shown, such as factoring 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, such as not rejecting the negative root.

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] 3, but no work or fewer than three trials and 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

[33] incorrect procedure.

[2] 40, and appropriate work is shown, such as  $x = 180 - (70 + 70)$  or correctly labeling all the angles in the diagram.

[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] A correct equation is written, but no further correct work is shown.

or [1] The measures of  $\angle ACB$  and  $\angle ABC$  are both found to be  $70^\circ$ , but no further correct work is shown.

or [1] An incorrect equation of equal difficulty is solved appropriately.

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

[34] incorrect procedure.

[2] 17, and appropriate work is shown, such as solving the equation  $x + 12 = 3x + 2$ .

[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] A correct equation is written and solved for  $x$ , but no further correct work is shown.

or [1] 17, 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

[35] incorrect procedure.

[3] 12, and appropriate work is shown, such as finding the rates of both vehicles and then subtracting 48 from 60.

[2] Appropriate work is shown, but one computational error is made.

or [2] The rates of both vehicles are found correctly, and appropriate work is shown, but they are not subtracted.

or [2] The rates of both vehicles are found correctly, and the correct difference is found, but no work is 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 rates of both vehicles are found correctly, but no work is shown, and the difference is not found.

or [1] 12, 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

[36] incorrect procedure.

- [3] 4, and an appropriate sketch is drawn that shows a circle with  $C$  as its center and a radius of 6 and two parallel lines, one 3 units above and one 3 units below line  $p$ .
- [2] An appropriate sketch is drawn, but the answer 4 is not found.
- or [2] Only one locus is drawn correctly, but the appropriate number of points of intersection is found.
- [1] Only one locus is drawn correctly, and no further correct work is shown.
- or [1] Both loci are drawn incorrectly, but the appropriate number of points of intersection is found.
- or [1] 4, but no work or sketch 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.
- [37] incorrect procedure.

- [4] 4, and appropriate work is shown.
- [3] Appropriate work is shown, but one computational or rounding error is made.
- or [3] Appropriate work is shown to find 4,860, the area of the parking lot, but no further correct work is shown.
- [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 an incorrect conversion.
- or [2] The property has been divided into appropriate sections (e.g.,  $108 \times 72$ , the entire property, and  $52 \times 52$ , the building) and correct areas are found, 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] 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.
- [38] incorrect procedure.

- [4] Contrapositive, and all three statements are written correctly.
- [3] Contrapositive, and only two of the statements are written correctly  
or [3] All three statements are written correctly, but the contrapositive is not identified.
- [2] Contrapositive, and only one statement is written correctly.
- or [2] Only two statements are written correctly, and the contrapositive is not identified.
- [1] All three statements are written incorrectly, but the contrapositive is identified.
- or [1] Only one statement is written correctly, and the contrapositive is not identified.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [39] incorrect procedure.