

1. If x is a whole number, then $x^2(x^2-1)$ is always divisible by

(a) 45

(c) 12

(b) 25

(d) 15

2. Find the greatest number which on dividing 1657 and 2037 leaves remainders 6 and 5 respectively.

(a) 163

(c) 148

(b) 127

(d) 115

3. A rectangular courtyard 3.78 meters long and 5.25 meters wide is to be paved exactly with square tiles, all of the same size. What is the largest size of the tile which could be used for the purpose?

(a) 18 cm

(c) 15 cm

(b) 25 cm

(d) 21 cm

4. What is the difference between the biggest and the smallest fraction among $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$ and $\frac{5}{6}$?

(a) $\frac{1}{6}$

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

(b) $\frac{1}{2}$

(d) $\frac{1}{3}$

5. Find the value of the below expression up to 4 places of decimals:

$$1 + \frac{1}{(1 \times 2)} + \frac{1}{(1 \times 2 \times 4)} + \frac{1}{(1 \times 2 \times 4 \times 8)} + \frac{1}{(1 \times 2 \times 4 \times 8 \times 16)}$$

(a) 3.1416

(c) 1.6416

(b) 2.1416

(d) 0.1416

6. If $(x/y) = (6/5)$, find the value of $(x^2+y^2)/(x^2-y^2)$

(a) $\frac{62}{11}$

(c) $\frac{60}{11}$

(b) $\frac{61}{11}$

(d) $\frac{59}{11}$

7. One test tube contains some acid and another test tube contains an equal quantity of water. To prepare a solution, 20 grams of the acid is poured in to the second test tube. Then, two-thirds of the so-formed solution is poured from the second test tube in to the first test tube. If the fluid in first test tube is four times that in the second, what quantity of water was taken initially?

(a) 12 grams

(c) 25 grams

(b) 31 grams

(d) 40 grams

8. If $\sqrt{3} = 1.732$, find the value of $\sqrt{192} - \frac{1}{2}\sqrt{48} - \sqrt{75}$. Correct to three places of decimal.

(a) 0.732

(c) 2.732

(b) 1.732

(d) 3.732

9. There were 35 students in a hostel. Due to the admission of 7 new students, the expenses of mess were increased by \$42 per day while the average expenditure per head diminished by \$1. What was the original expenditure?

(a) \$422

(c) \$420

(b) \$421

(d) \$419

10. David wants to spread wildflower seeds in a rectangular field that is 60 feet wide and 70 feet long. Each package of wildflower seeds covers about 175 square feet and costs \$6.95. Which of the following amounts is closest to the total cost of the wildflower seeds David needs for this field?

(a) \$24.00

(c) \$604.00

(b) \$170.00

(d) \$310.00

11. Celeste made a model of her grandfather's fishing boat using a scale where 2 inches represents 3 feet. Her grandfather's actual boat is 28 feet long. What is the length of Celeste's model boat?

(a) $14/3$ in

(c) 22 in

(b) $56/3$ in

(d) 42 in

12. The table shows values for the independent and dependent quantities in a functional relationship.

| Independent Quantity | Dependent Quantity |
|----------------------|--------------------|
| 0 | 8 |
| 1 | 7 |
| 2 | 6 |
| 3 | 5 |
| 4 | 4 |

Which function best represents this relationship?

(a) $f(x) = x + 8$

(c) $f(x) = 8 - x$

(b) $f(x) = x - 8$

(d) $f(x) = -8 - x$

13. Which expression represents the area of a rectangle with sides measuring x^2y and $2xy^2$?

(a) $2x^3y^3$

(c) $4x^4y^3$

(b) $2x^2y^2$

(d) $4x^3y^4$

14. A company designed a new label to completely cover the lateral surface area of a cylindrical can without any overlap. The can is $11\frac{1}{2}$ inches tall and 3 inches in diameter. Which of the following is closest to the area of this new label?

(a) 52 in.^2

(c) 104 in.^2

(b) 160 in.^2

(d) 66 in.^2

15. Tyler wants to buy a video-game system for \$375. He can pay for the system in 12 months if he pays \$75 now and \$25 each month. How will the number of monthly payments be affected if Tyler pays \$75 now and \$30 each month?

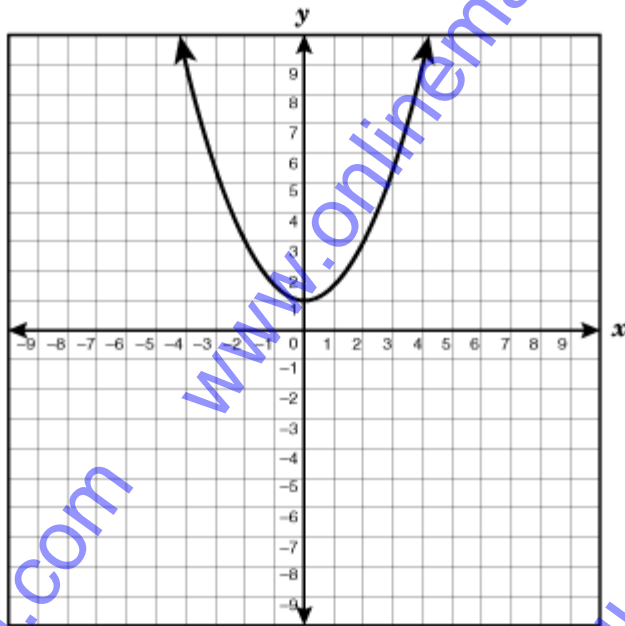
(a) He will make 10 fewer monthly payments.

(b) He will make 2 fewer monthly payments.

(c) He will make 3 fewer monthly payments.

(d) He will make 5 fewer monthly payments.

16. What is the parent function of the graph shown on the grid below?



(a) $y = -x$

(c) $y = x$

(b) $y = -x^2$

(d) $y = x^2$

17. Desmond wants to take guitar lessons. The one-time registration fee is \$60, and each lesson costs \$40. Which of the following inequalities can Desmond use to determine x , the number of lessons he can take if he wants to spend no more than c dollars?

(a) $60x + 40x \leq c$

(c) $60x + 40x \geq c$

(b) $60 + 40x \leq c$

(d) $60 + 40x \geq c$

18. A student tried to solve the following equation but made a mistake.

Step 1: $9 - 5(2x + 1) = -28$

Step 2: $4(2x + 1) = -28$

Step 3: $8x + 4 = -28$

Step 4: $8x = -32$

Step 5: $x = -4$

(a) step2

(c) step4

(b) step3

(d) step5

19. If the graph of $y = \frac{3}{4}x^2 - 1$ is translated up 4 units, which of the following equations represents the resulting graph?

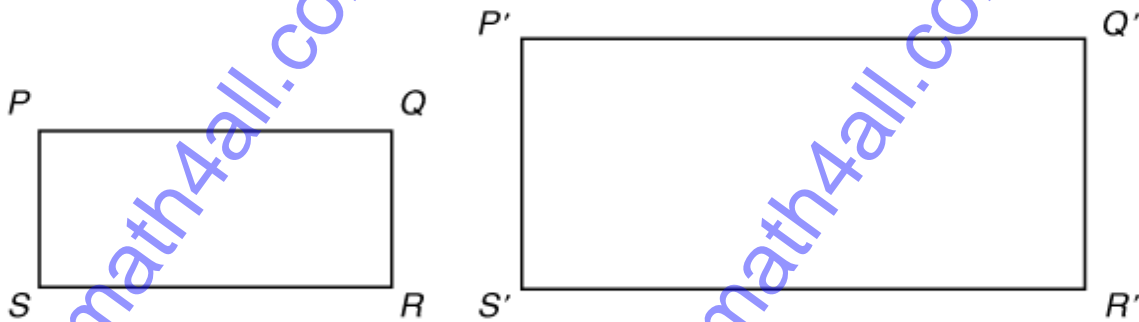
(a) $y = 3x^2 - 4$

(c) $y = 3x^2 + 4$

(b) $y = \frac{3}{4}x^2 + 3$

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

20. Use the ruler on the Mathematics Chart to measure the side lengths of rectangle $PQRS$ and rectangle $P'Q'R'S'$ to the nearest 0.1 centimeter.



Which of the following is closest to the scale factor used to dilate rectangle $PQRS$ to create rectangle $P'Q'R'S'$?

(a) 0.625

(c) 0.525

(b) 1.6

(d) 2.0

21. Mr. Sylvester bought gardening supplies for \$79.75, not including tax. If the tax rate was 8%, what was the total cost of these gardening supplies, including tax?

(a) \$86.13

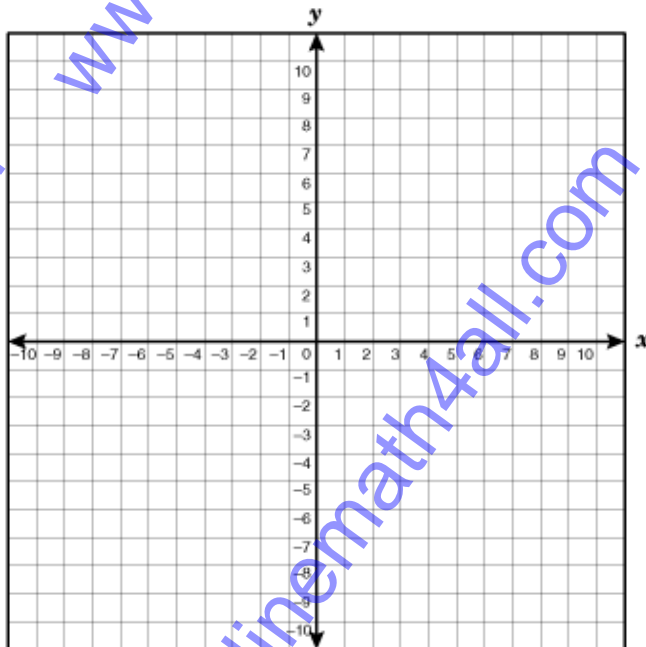
(c) \$87.75

(b) \$73.37

(d) None of these

22. The table below shows ordered pairs of a linear function.

| x | y |
|-----|-----|
| -6 | -10 |
| -3 | -8 |
| 3 | -4 |
| 6 | -2 |



What are the x - and y -intercepts for the graph of this linear function?

(a) x -intercept: $(-6, 0)$
 y -intercept: $(0, 9)$

(c) x -intercept: $(0, 9)$
 y -intercept: $(-6, 0)$

(b) x -intercept: $(0, -6)$
 y -intercept: $(9, 0)$

(d) x -intercept: $(9, 0)$
 y -intercept: $(0, -6)$

23. Which expression is equivalent to 3 times the sum of x squared and 7?

(a) $3x^2 + 7$

(c) $3(x+7)^2$

(b) $(3x+7)^2$

(d) $3(x^2 + 7)$

24. If y is a function of x in $y = (1/2)x + 3$, which of the following statements is true?

(a) The independent variable, y , is 3 more than $\frac{1}{2}$ the dependent variable, x .

(b) The dependent variable, y , is 3 more than $\frac{1}{2}$ the independent variable, x .

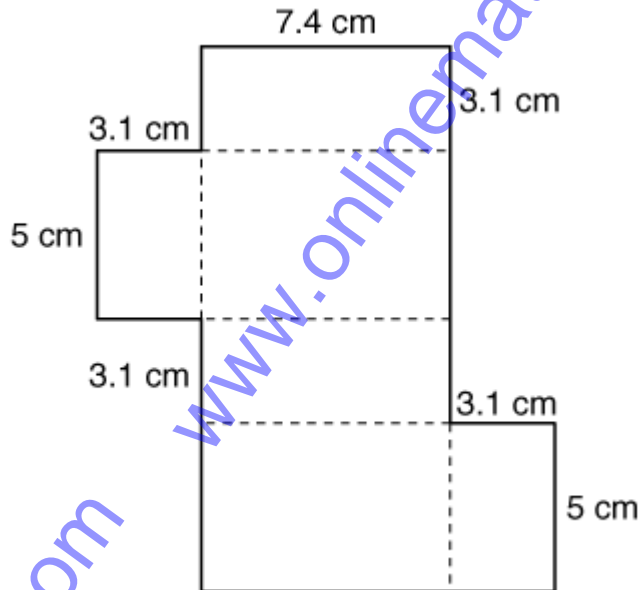
(c) The independent variable, x , is 3 more than $\frac{1}{2}$ the dependent variable, y .

(d) The dependent variable, x , is 3 more than $\frac{1}{2}$ the independent variable, y .

25. Carmen received a \$0.25 raise in her hourly pay rate. Her first paycheck after the raise showed a total pay of \$308 for 40 hours of work. Which method can be used to determine what Carmen's hourly pay rate was before the raise?

- (a) Subtract 0.25 from 40 and then divide 308 by this difference
- (b) Divide 308 by 40 and then add 0.25 to this quotient
- (c) Multiply 0.25 by 40 and then divide 308 by this product
- (d) Divide 308 by 40 and then subtract 0.25 from this quotient

26. The net of a rectangular prism is shown below.



What is the total surface area of the rectangular prism represented by this net?

(a) 114.70 cm^2

(c) 105.00 cm^2

(b) 150.88 cm^2

(d) 119.88 cm^2

27. The volume of a cube is $125x^3y^3$ cubic units, and the area of its base is $25x^2y^2$ square units. What is the length of an edge of the cube in units if $x > 0$ and $y > 0$?

(a) $5/xy$ units

(c) $5xy$ units

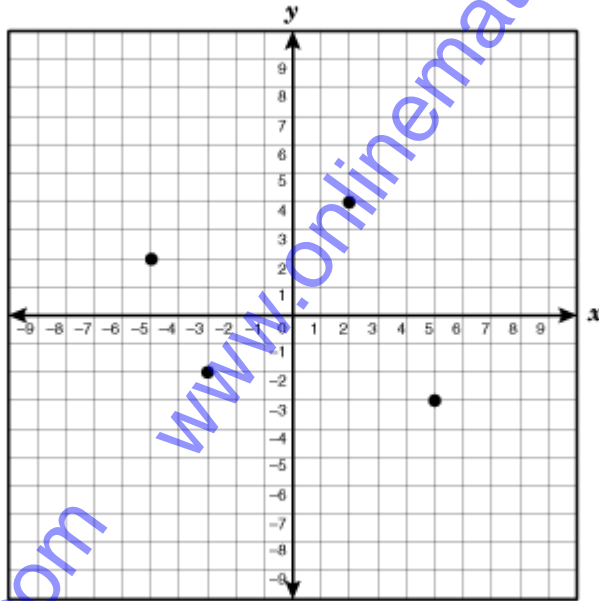
(b) $5x^5y^5$ units

(d) $100xy$ units

28. There are 8 sixth-grade classes and 195 sixth-grade students at Edison Middle School. The equation $8s = 195$ can be used to determine s , the mean number of students per class. Based on the solution $s = 24.375$, which of the following statements could be true?

- (a) There are 5 sixth-grade classes with 24 students each and 3 sixth-grade classes with 25 students each.
- (b) There are 7 sixth-grade classes with 24 students each and 1 sixth-grade class with 25 students.
- (c) There are 8 sixth-grade classes with 25 students each.
- (d) There are 8 sixth-grade classes with 24 students each.

29. Which point on the grid below satisfies the conditions $x > -2$ and $y \leq 3$?



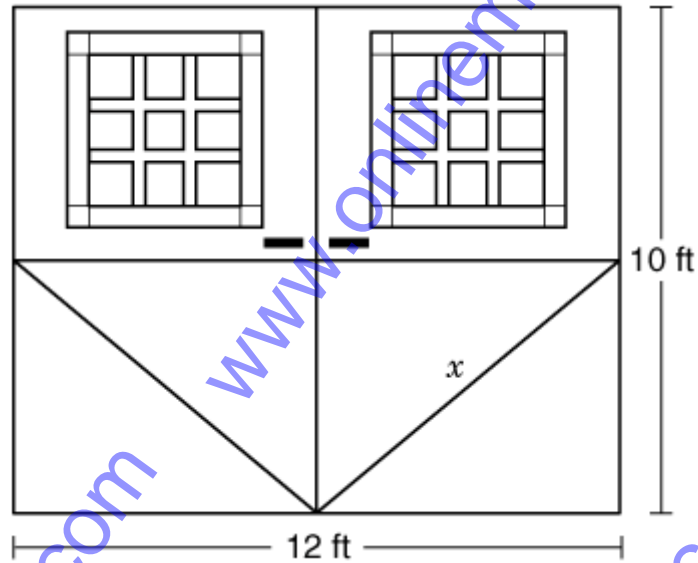
(a) (-5, 2)

(c) (2, 4)

(b) (5, -3)

(d) (-3, -2)

30. The two identical rectangular doors of a barn have glass panes in the top half, and each bottom half is made of solid wood, as shown below.



Which of the following measurements is closest to x , the length of the diagonal brace on the bottom half of each door?

(a) $13/2$ ft

(c) 8 ft

(b) 11 ft

(d) $11/2$ ft

31. Point S and point T are located on the same coordinate plane. Both the x -coordinate and the y -coordinate for point S are negative. Both the x -coordinate and the y -coordinate for point T are positive. Which statement about the line containing points S and T must be true?

- (a) The graph of the line has a negative slope.
- (b) The graph of the line has a positive slope.
- (c) The graph of the line has a negative y -intercept.
- (d) The graph of the line has a positive y -intercept.

32. Which of the following problems can be solved using the equation $5x + 35 = 50$?

(a) Tamara borrowed \$50 from a friend. The friend charged her 5% simple interest per month for x months. If Tamara pays her friend \$5 per month, after how many months will Tamara owe her friend \$35?

(b) It took Kyla 5 hours to ride her bike 35 miles. If Kyla continued riding at this same rate, how many hours, x , would it take her to ride 50 miles?

(c) Akashi made x deposits of \$5 each into his bank account. Then he withdrew \$35. If he had \$50 in his account, how many deposits did he make?

(d) Marcus purchased a new shirt for \$35 and 5 pairs of socks for x dollars a pair. Marcus spent a total of \$50. How much did each pair of socks cost?

33. A quadratic function is given below.

$$f(x) = 3x^2 - x + 6$$

What is $f(2)$?

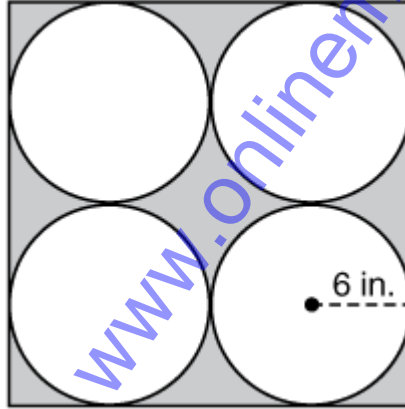
(a) 40

(c) 16

(b) 28

(d) 4

34. Martina designed a painting for art class, as shown in the drawing below. Her design contains 4 circles on a square canvas. Each circle has a radius of 6 inches. The circles touch the edges of the canvas and each other, as shown below.



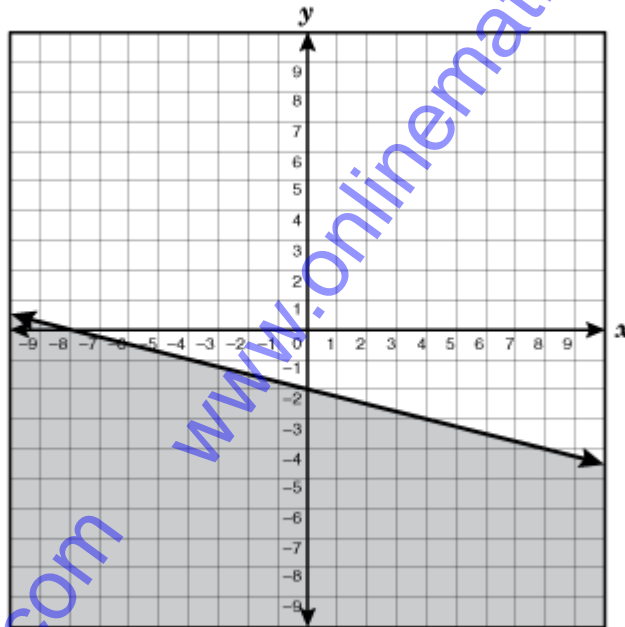
The shaded section of Martina's design will be painted black. Which is closest to the area that will be painted black?

- (a) 124 in.^2 (c) 308 in.^2
(b) 463 in.^2 (d) 116 in.^2

35. The manager of a day-care center wants to serve $\frac{1}{2}$ pint of milk to each of the 48 children at the center each day. She can buy the milk in $\frac{1}{2}$ pint cartons for \$0.35 each, or she can buy 1-gallon containers of milk for \$3.26 each. Which of these best represents how much the manager will save on milk each day if she buys the milk in 1-gallon containers?

- (a) \$9.78 (c) \$7.02
(b) \$2.76 (d) \$2.91

36. Which of the following inequalities best describes the graph shown below?



(a) $y \leq -\frac{1}{4}x - 8$

(c) $y \geq -\frac{1}{4}x - 8$

(b) $y \leq -\frac{1}{4}x - 2$

(d) $y \geq -\frac{1}{4}x - 2$

37. If y varies directly with x , and y is 84 when x is 16, which of the following represents this situation?

(a) $y = 100x$

(c) $y = 68x$

(b) $y = (21/4)x$

(d) $y = (21/4)x$

38. If the diameter of a circle is dilated by a scale factor of 0.6, what will be the effect on the circle's circumference?

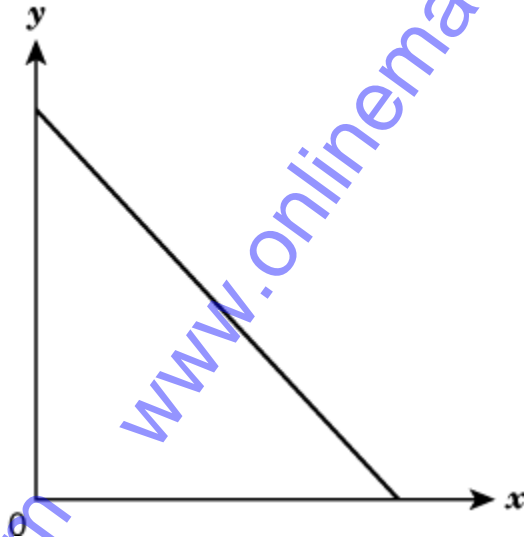
(a) The circumference will be 0.3 times as large.

(b) The circumference will be 0.36 times as large.

(c) The circumference will be 1.88 times as large.

(d) The circumference will be 0.6 times as large.

39. The function graphed below shows a relationship between x and y .



Which of the following relationships can best be represented by this graph?

- (a) The total number of gallons of gas left in a gas tank, y , based on x , the total number of miles driven
- (b) The total cost of a shipment of jeans, y , based on x , the number of jeans in the shipment
- (c) The total amount of hourly earnings, y , based on x , the total number of hours worked
- (d) The total number of pounds of flour used, y , based on x , the total number of loaves of bread baked

40. If today is Tuesday, what day of the week will it be 100 days from today?

(a) Tuesday

(c) Thursday

(b) Wednesday

(d) Friday

41. How does the graph of $y = 3x^2 - 5$ compare with the graph of $y = 3x^2 + 8$?

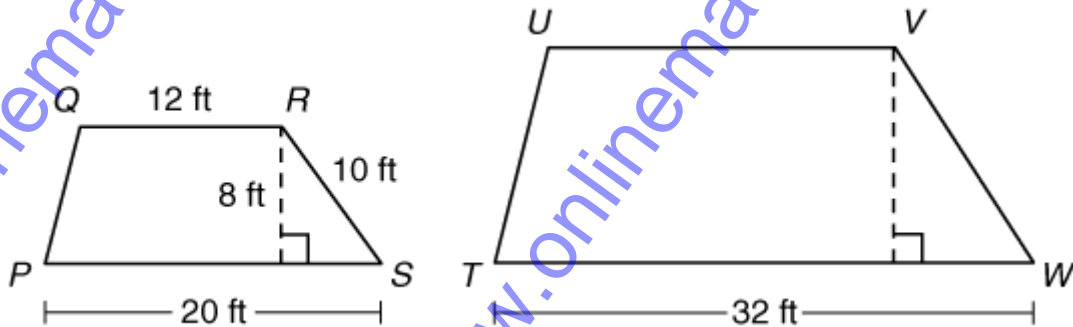
(a) The graph of $y = 3x^2 - 5$ is 3 units above the graph of $y = 3x^2 + 8$.

(b) The graph of $y = 3x^2 - 5$ is 13 units below the graph of $y = 3x^2 + 8$.

(c) The graph of $y = 3x^2 - 5$ is 3 units to the right of the graph of $y = 3x^2 + 8$.

(d) The graph of $y = 3x^2 - 5$ is 13 units to the left of the graph of $y = 3x^2 + 8$.

42. Trapezoid $PQRS$ is similar to trapezoid $TUVW$.



What is the height of the larger trapezoid?

(a) $96/5$ ft

(c) $64/5$ ft

(b) 16 ft

(d) 20 ft

43. A salesperson's commission, c , is 6% of her total sales, s . Which function best represents the salesperson's commission?

(a) $c = 0.06s$

(c) $c = s + 0.06s$

(b) $c = s + 0.06$

(d) $c = (6/s)100$

44. Kara claims that the expression $x^2 + 1$ results in an even number for all integer values of x . Which value of x shows that Kara's claim is incorrect?

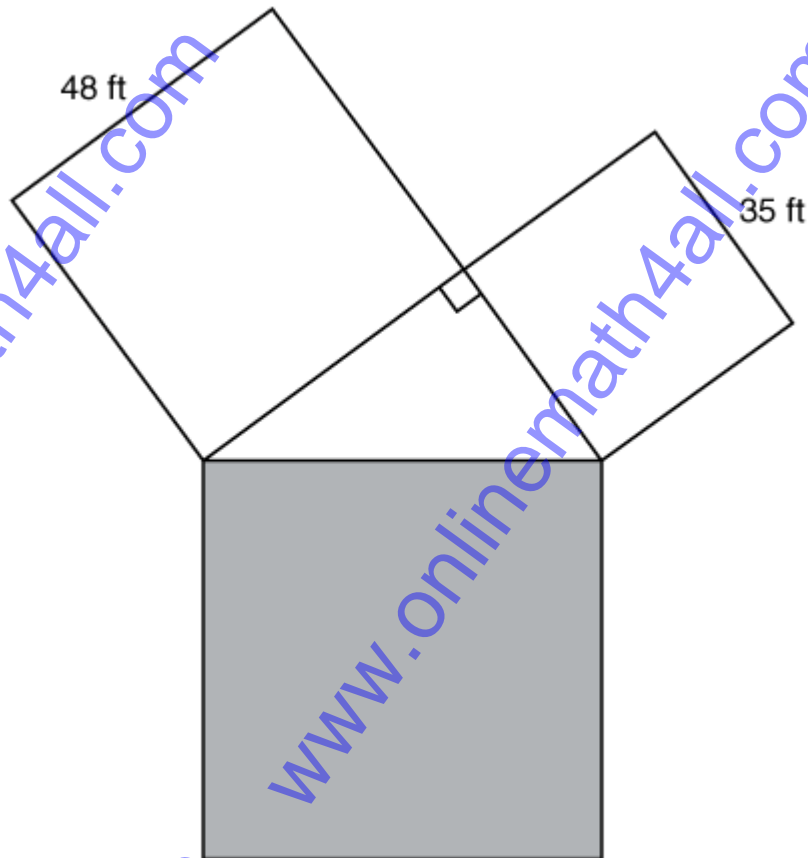
(a) $x=5$

(c) $x=0$

(b) $x=-3$

(d) $x=-1$

45. The drawing below shows three squares joined at their vertices to form a right triangle.



(a) 3529 ft^2

(c) 6889 ft^2

(b) 1079 ft^2

(d) 169 ft^2

46. Josh earns money by washing cars in his neighborhood. He spent \$215 on supplies and charges \$15 for each car washed. Josh's profit, p , can be represented by the function $p = 15n - 215$, where n represents the number of cars that Josh washes. What is the minimum number of cars Josh must wash to make a profit?

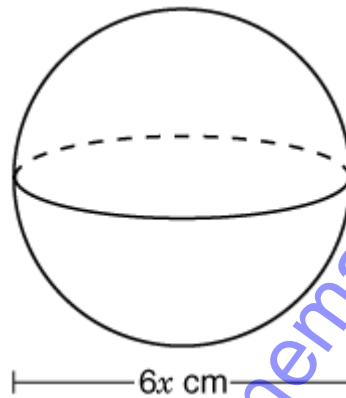
(a) 14

(c) 15

(b) 29

(d) None of these

47. A sphere with a diameter of $6x$ centimeters is shown below.



What is the volume of the sphere?

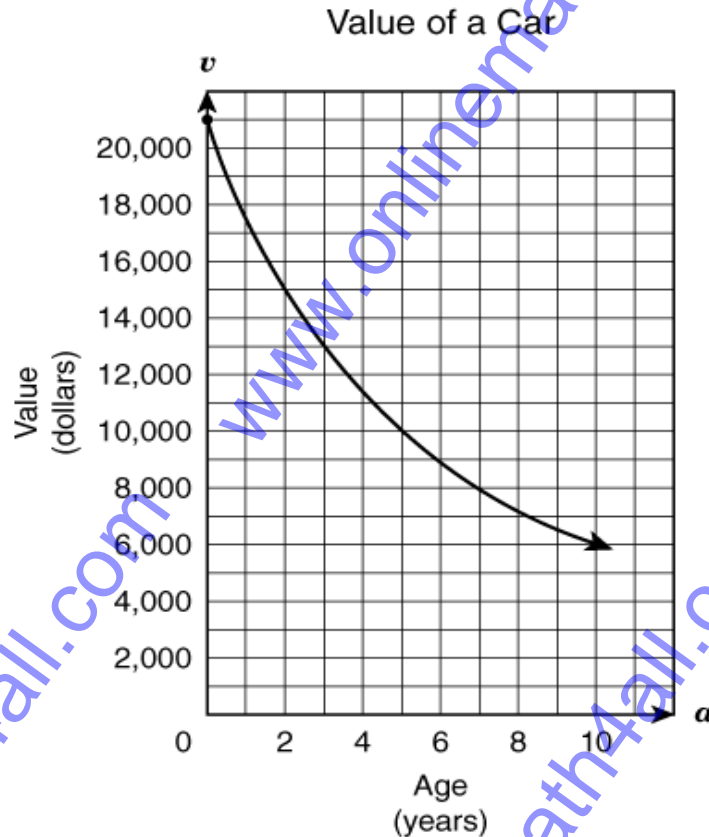
(a) $(4/3)\pi(3x)^3$

(c) $4\pi(3x)^2$

(b) $(4/3)\pi(6x)^3$

(d) $4\pi(6x)^2$

48. The graph below shows the relationship between the value of a car in dollars and the age of the car in years.



According to the graph, which of the following statements appears to be true?

- (a) The value of the car decreased by \$1,000 per year.
- (b) The value of the car decreased by \$2,000 per year.
- (c) The value of the car decreased more from Year 9 to Year 10 than in any other year.
- (d) The value of the car decreased more from Year 0 to Year 1 than in any other year.

49. In how many different ways can the letters of the word "DETAIL" be arranged in such a way that the vowels occupy only the odd positions?

(a) 24

(c) 36

(b) 54

(d) 66

50. What is the smallest number by which 3600 be divided to make it a perfect cube?

(a) 8

(c) 10

(b) 9

(d) 450

Answers:

- | | | | | | |
|-------|-------|-------|-------|-------|-------|
| 1. c | 2. b | 3. d | 4. a | 5. c | 6. b |
| 7. d | 8. b | 9. c | 10. b | 11. b | 12. c |
| 13. a | 14. a | 15. b | 16. d | 17. b | 18. a |
| 19. b | 20. b | 21. a | 22. d | 23. d | 24. b |
| 25. d | 26. b | 27. c | 28. a | 29. b | 30. c |
| 31. b | 32. d | 33. c | 34. a | 35. c | 36. b |
| 37. b | 38. d | 39. a | 40. c | 41. b | 42. c |
| 43. a | 44. c | 45. a | 46. c | 47. a | 48. d |
| 49. c | 50. d | | | | |