1. An army contingent of 616 members is to march behind an army band of 32 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march?

(a) 4 columns

(b) 8 columns

(c) 5 columns

(d) 9 columns

2. Find the HCF of 96 and 404 by the prime factorization method. Hence, find their LCM.
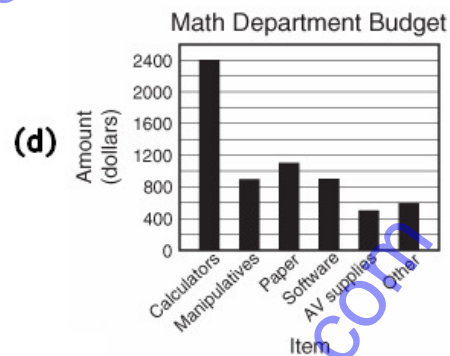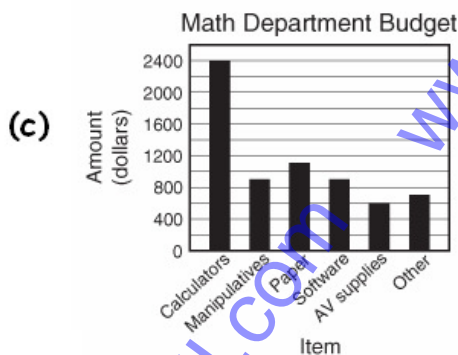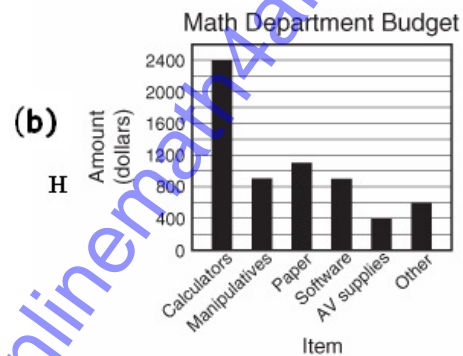
(a) 9696

(b) 1256

(c) 5269
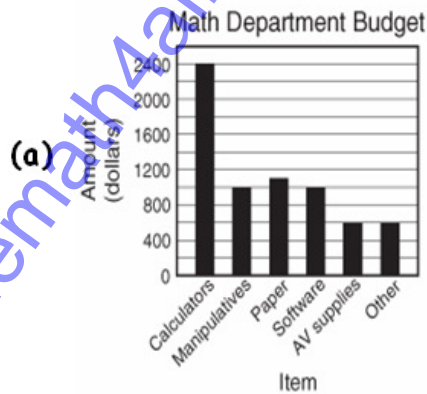
(d) 4926

3. The table shows a math department's budget for the upcoming school year.

Math Department Budget

Item	Amount (dollars)
Calculators	2400
Manipulatives	900
Paper	1100
Software	900
AV supplies	500
Other	600

Which bar graph best represents the data given in the table?

(a)

(b) H

(c)

(d)

4. Marlene was asked to find an expression that is not equivalent to 2^{12}. Which of the following is not equivalent to the given expression?
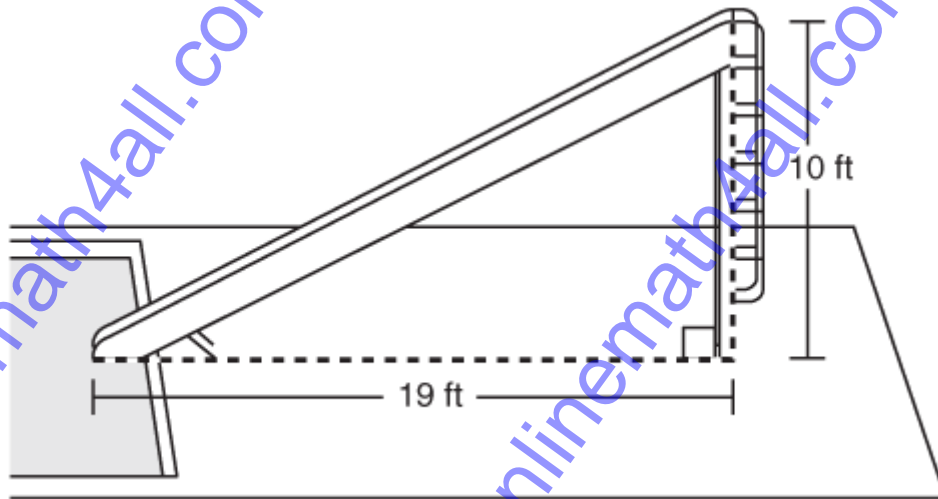
(a) $(2^2)^6$

(c) $(2^6)(2^6)$

(b) $(2^8)^4$

(d) $(2^3)(2^9)$

5. A slide was installed at the local swimming pool, as shown below.

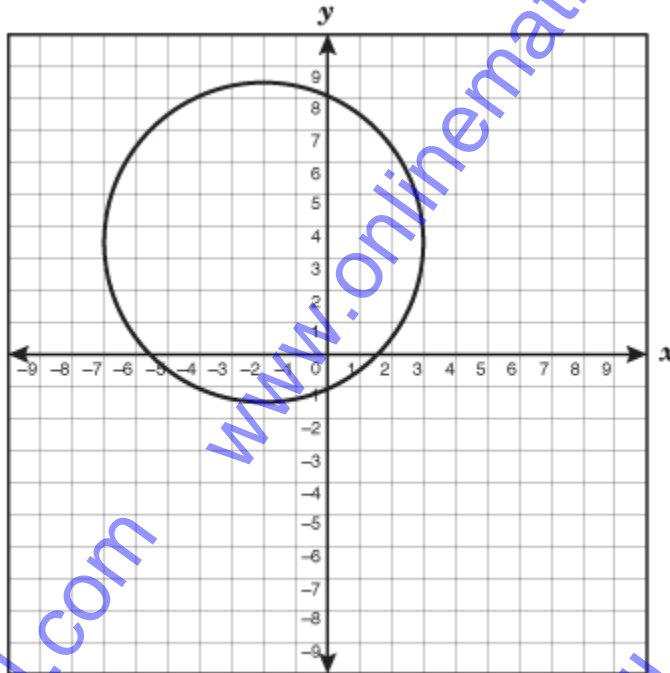Which is closest to the length of the slide?

(a) 29 ft

(c) 21 ft

(b) 16 ft

(d) 81 ft

6. The circle shown below has a diameter of 10 units.

Which of the following ordered pairs best represents the location of the center of the circle?

(a) (–2,5/2)   (c) (–2,9/2)

(b) (–2, 4)   (d) (-2,7/2)

7. There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ronald takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?

(a) 36 minutes

(c) 25 minutes

(b) 24 minutes

(d) 23 minutes

8. The sum of the digits of a two-digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number.

(a) 27

(c) 18

(b) 45

(d) 20

9. The table shows the first-class postage rates for different years.

Year	Rate
1995	$0.32
1991	$0.29
1989	$0.25
1985	$0.22
1981	$0.18
1978	$0.15
1975	$0.13
1974	$0.10
1971	$0.08

Which conclusion is true for the data given?

(a) The rate for first-class postage was above $0.18 during the 1970s.

(b) The rate for first-class postage remained below $0.32 during the 1990s.

(c) The rate for first-class postage remained below $0.29 during the 1980s.

(d) The rate for first-class postage increased by 4% between 1971 and 1995.

10. A chemist started an experiment with 5 grams of a chemical. The chemical was used at a rate of 0.01 gram per minute. Which equation best describes the relationship between c, the amount of chemical remaining in grams, and t, the time in minutes?
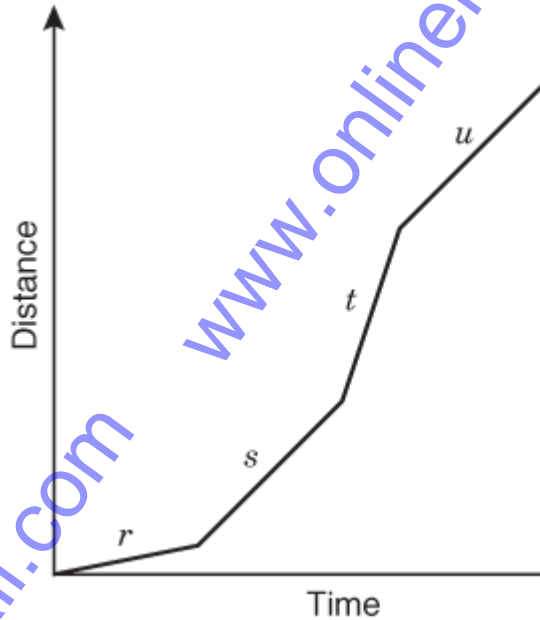
(a) $c = 5.01t$

(c) $c = 4.99t$

(b) $c = 5 - 0.01t$

(d) $c = 0.01t - 5$

11. The graph below represents Cheyenne's bicycle trip from her house to a friend's house.

On which segment of the graph does it appear that Cheyenne was riding her bicycle at the slowest pace?

(a) r   (c) t

(b) s   (d) u

12. Which data set is best described by the function $y = -2x^2 + 5x$?

(a)

x	y
-4	-52
-1	-3
2	2
3	9
6	-42

(c)

x	y
-3	-33
-1	-7
2	2
3	-3
5	-25

(b)

x	y
-5	-75
-3	-33
1	7
4	52
6	-42

(d)

x	y
-2	-18
2	-2
5	-24
6	-42
8	-88

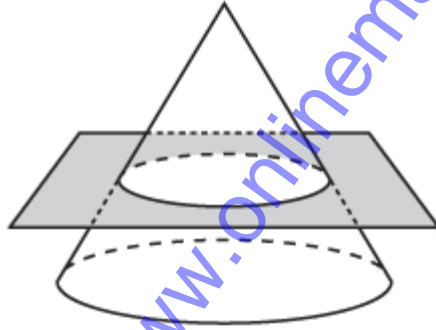13. A rectangle has a length of $2x + 1$ and a width of $5x - 4$. Which expression best describes the area of the rectangle?
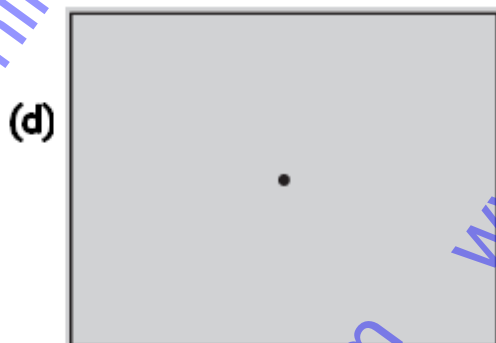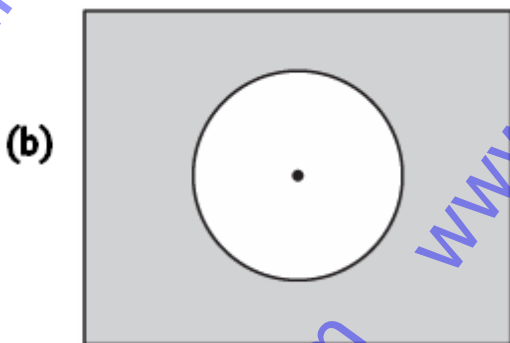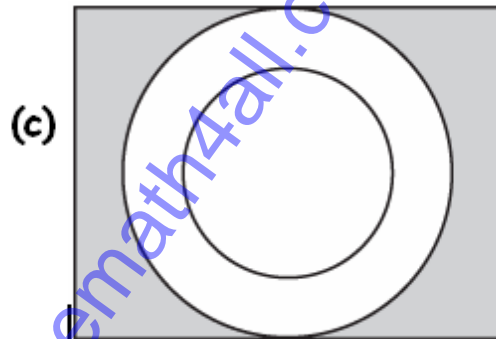
(a) $7x - 3$

(c) $10x^2 - 13x - 4$

(b) $14x - 6$

(d) $10x^2 - 3x - 4$

14. Lee designed a table that appears to be a cone with a wooden board passing through it, as shown below.

Which of the following best represents a top view of this table?

(a)

(c)

(b)

(d)
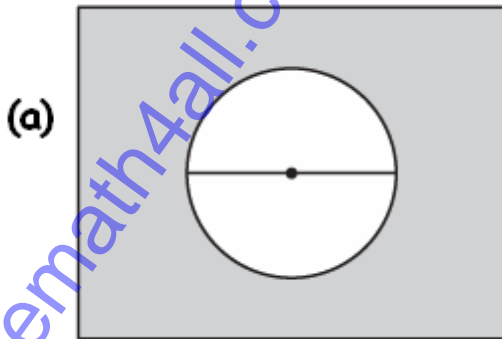
15. The table below shows the results of rolling a fair number cube 50 times during a classroom activity.

Number-Cube Data

Outcome	Frequency
1	7
2	12
3	10
4	9
5	8
6	4

What is the difference between the theoretical probability of rolling a number less than 4 and the experimental results recorded in the table above?

(a) 8%   (c) 58%

(b) 79%   (d) 29%

16. Represent the following situations in the form of quadratic equations: A train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/h less, then it would have taken 3 hours more to cover the same distance. We need to find the speed of the train.(Consider U be the speed of the train)
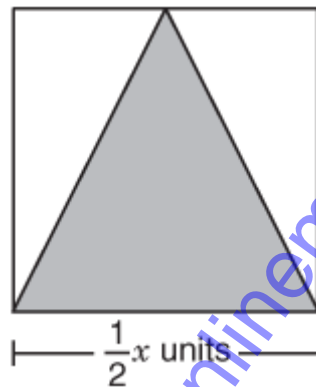
(a) $u^2 - 8u + 1280 = 0$

(c) $u^2 - 8u - 1280 = 0$

(b) $u^2 + 8u - 1280 = 0$

(d) $u^2 + 8u + 1280 = 0$

17. A triangle is inscribed in a square, as shown below.

$\frac{1}{2}x$ units

What is the area of the shaded triangle inscribed in the square?

(a) $x^2/4$ square units

(c) $x^2/8$ square units

(b) $x^2/2$ square units

(d) $x^2/16$ square units

18. Jeremy's house is 45 feet wide. In a photograph the width of the house was 2.5 inches, and its height was 2 inches. What is the actual height of Jeremy's house?

(a) 18 ft   (c) 32 ft

(b) 26 ft   (d) 36 ft

19. Which line appears to have a slope of zero?
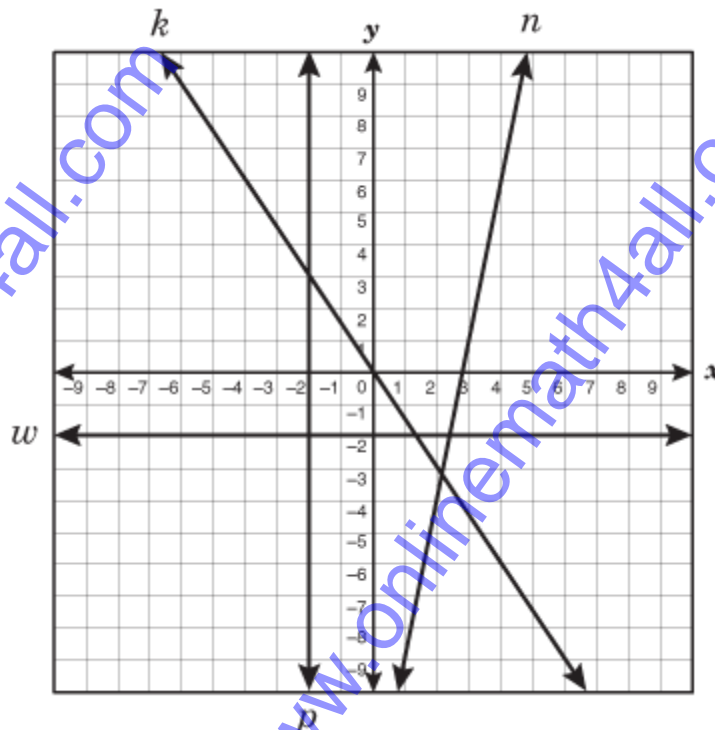
(a) Line *n*   (c) Line *w*

(b) Line *k*   (d) Line *p*

20. The length of each leg of an isosceles triangle is 5 centimeters more than twice the length of the base. If the perimeter of this isosceles triangle is 95 centimeters, what is the length of the base?

(a) 17 cm

(b) 21 cm

(c) 30 cm

(d) 39 cm

21. The squares below show a pattern.

Stage 1	
Stage 2	
Stage 3	
Stage 4	

Which expression can be used to determine the number of squares at stage n?

(a) $5n - 3$

(b) $4n - 2$

(c) $2n^2$

(d) $n^2 + n$

22. The area of the shaded portion of the rectangle shown below is 440 square feet.
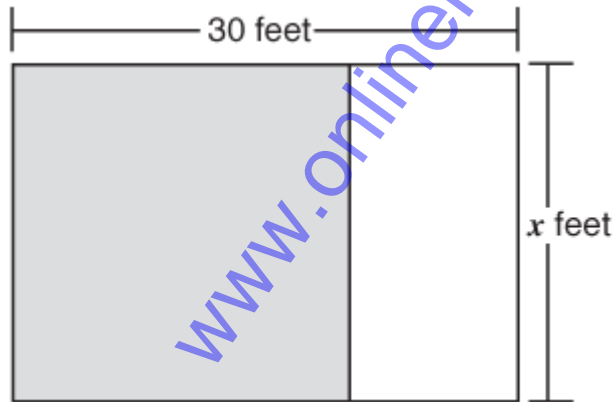
How can the area of the unshaded portion of the rectangle be expressed in terms of x in square feet?

(a) $440x - 30$

(c) $(30 - 440)x$

(b) $(30 + x)440$

(d) $30x - 440$

23. Find two consecutive odd positive integers, sum of whose squares is 290.

(a) 9 and 11

(c) 13 and 15

(b) 11 and 13

(d) 15 and 17

24. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

(a) 6 km/h   (c) 4 km/h

(b) 2 km/h   (d) 7 km/h

25. Find the 10th term of the Arithmetic progression 2, 7, 12, . . .

(a) 20   (c) 37

(b) 47   (d) 57

26. Pentagon *PQRST* is graphed on the coordinate grid below.
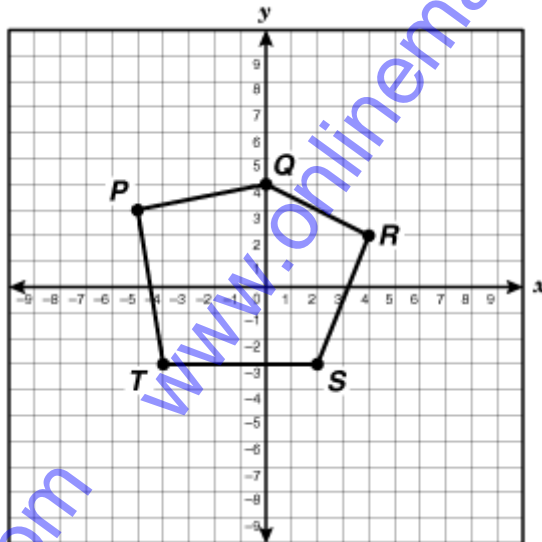
Which of the following points would be the location of *S* if pentagon *PQRST* is dilated by a scale factor of 2 and has a center of dilation at (0, 0)?

(a) (–6, 4)

(b) (2, –6)

(c) (4, –6)

(d) (4, –3)

27. Mrs. Aman asked her students to look at the drawing shown below to determine the length of *d*.
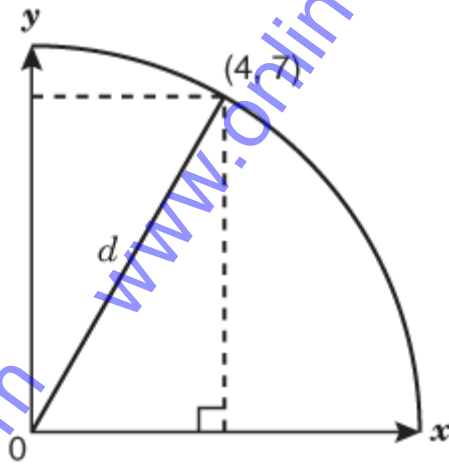
Which of the following student responses best represents the length of *d*?

(a) 8 units   (c) 14 units

(b) 11 units   (d) 3 units

28. How many two-digit numbers are divisible by 3?

(a) 20   (c) 28

(b) 29   (d) 30

29. In a flower bed, there are 23 rose plants in the first row, 21 in the second, 19 in the third, and so on. There are 5 rose plants in the last row. How many rows are there in the flower bed?
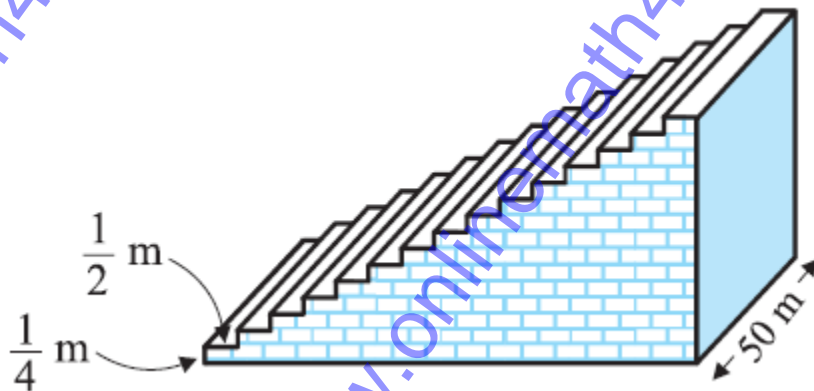
(a) 12

(c) 20

(b) 10

(d) 13

30. A small terrace at a football ground comprises of 15 steps each of which is 50 m long and built of solid concrete. Each step has a rise of 1/4m and a tread of ½ m. Calculate the total volume of concrete required to build the terrace.

(a) 750 m³

(c) 400 m³

(b) 950 m³

(d) 300 m³

31. A toad is 25 feet north of a bullfrog. Every time the toad jumps 1 foot, the bullfrog jumps 3 feet. If both the toad and the bullfrog jump due north, how many jumps will it take for the bullfrog to pass the toad?

(a) 12

(c) 13

(b) 9

(d) 7

32. Which of these are characteristics of the parent function of a quadratic equation?

  I.   The parent function of a quadratic equation has the vertex at (0, 0).
 II.   The parent function of a quadratic equation opens downward.
III.   The parent function of a quadratic equation has the y-axis as its line of symmetry.

(a) I and II only

(c) II and III only

(b) I and III only

(d) I, II, and III

33. Mr. Bergman built a rectangular sandbox for his children, as shown below.

18 inches

6 ft

9 ft

If each 50-pound bag contains approximately 0.70 cubic foot of sand, which is closest to the number of bags of sand that Mr. Bergman used to completely fill this sandbox?

(a) 81

(c) 972

(b) 19

(d) 116

34. What is the x-coordinate of the x-intercept of the function?

$$\frac{2}{3}y = -6x + 12$$

(a) 12

(c) -9

(b) 18

(d) 2

35. Stephen claims that the exterior angle for any regular polygon is either an acute angle or an obtuse angle. If each of the following polygons is regular, which one could disprove Stephen's theory?
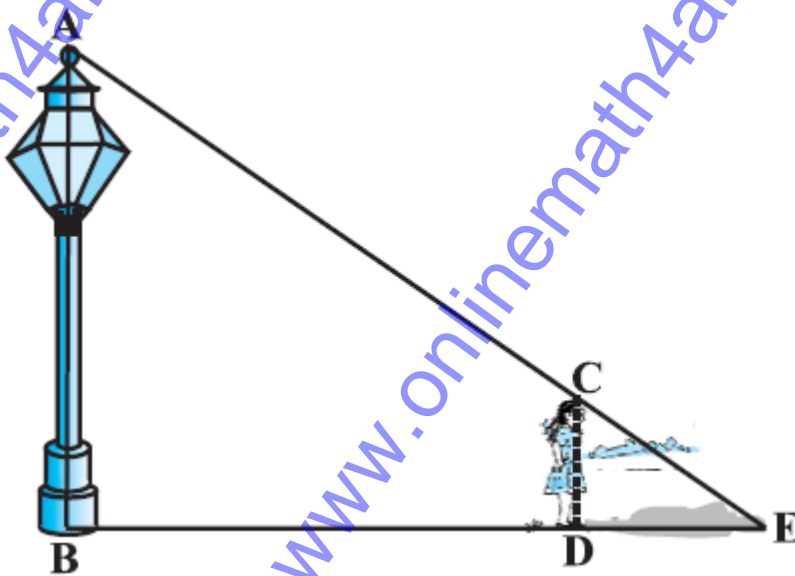
(a) Triangle

(c) Pentagon

(b) Quadrilateral

(d) Hexagon

36. A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.

(a) 1.6 m

(c) 2.3 m

(b) 3.2 m

(d) 6.8 m

37. Two poles of heights 6 m and 11 m stand on a plane ground. If the distance between the feet of the poles is 12 m, find the distance between their tops.

(a) 16 m   (c) 13 m

(b) 20 m   (d) 17 m

38. Find the area of a triangle whose vertices are (1, –1), (– 4, 6) and (–3, –5).

(a) 24 square units   (c) 42 square units

(b) 30 square units   (d) 64 square units

39. In 2004 a married couple could have calculated their estimated income tax, t, for that year using the equation $t = 0.25c - 6525$, in which c represents their combined taxable income. If a married couple had a combined taxable income between $60,000 and $64,000, which of the following is a reasonable amount for their income tax?
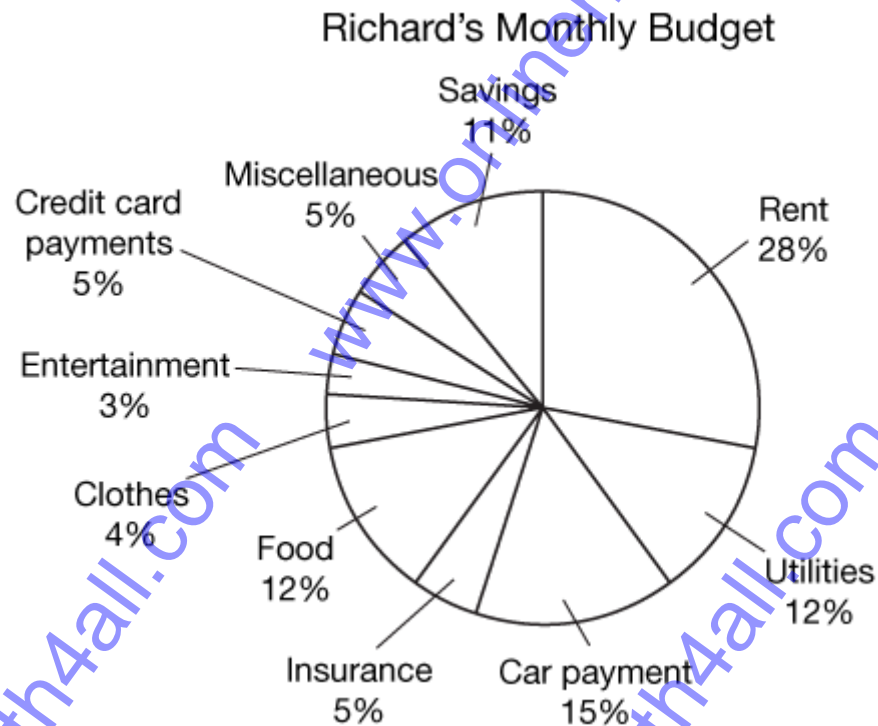
(a) $6,525   (c) $13,869

(b) $8,975   (d) $15,500

40. Richard budgets $1200 of his job earnings on a monthly basis. The graph below shows his monthly budget.

Richard's Monthly Budget

Savings 11%
Miscellaneous 5%
Credit card payments 5%
Rent 28%
Entertainment 3%
Clothes 4%
Food 12%
Insurance 5%
Car payment 15%
Utilities 12%

Which conclusion can be drawn from the information given?

(a)   More than 30% of Richard's budget is for credit card payments, insurance, and food combined.
(b)   Richard budgets $384 for utilities, insurance, and his car payment combined.
(c)   Less than 50% of Richard's budget is for rent, food, and utilities combined.
(d)   Richard budgets $228 for savings, entertainment, and clothes combined.

41. Jerry has a CD case that contains 4 country music CDs, 1 rock-and-roll CD, 2 rap CDs, and 3 Tejano CDs. What is the probability of Jerry randomly selecting a Tejano CD and then, without replacing it, randomly selecting a rap CD from his case?

(a) 1/2

(c) 1/15

(b) 1/50

(d) 1/20

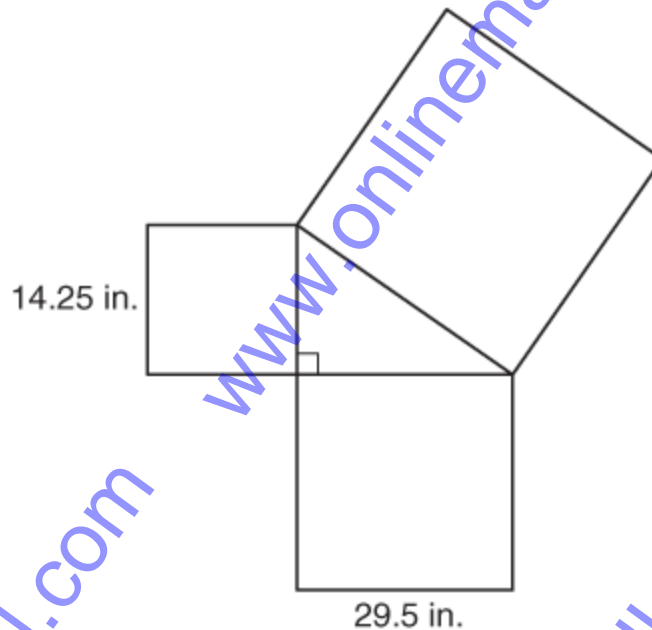42. Simplify the expression $6 - 3(5x + 2) - 10x$.

(a) -25 x

(c) $8 - 25x$

(b) $5x + 6$

(d) $12 - 25x$

43. The drawing below shows how 3 squares can be joined at their vertices to form a right triangle.

14.25 in.

29.5 in.

Which is closest to the area in square inches of the largest square?

(a) 1914 in^2 (c) 210 in^2

(b) 233 in^2 (d) 1073 in^2

44. Which of the following shapes could not represent a top, front, or side view of a trapezoidal prism?

(a) A square   (c) A rectangle

(b) A trapezoid   (d) A triangle

45. If y is a function of x in the equation $y = x^2 - 9$, which statement is true?

(a)   The independent variable x is equal to 9 less than the square of the dependent variable y.
(b)   The independent variable y is equal to 9 less than the square of the dependent variable x.
(c)   The dependent variable y is equal to 9 less than the square of the independent variable x.
(d)   The dependent variable x is equal to 9 less than the square of the independent variable y.

46. If sec 4A = cosec (A – 20°), where 4A is an acute angle, find the value of A.

(a) 22^0 (c) 32^0

(b) 52^0 (d) 55^0

47. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30°, which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60°. Find the time taken by the car to reach the foot of the tower from this point.

(a) 6 seconds

(c) 4 seconds

(b) 3 seconds

(d) 5 seconds

48. Lee, Kelly, Linda, and Madison all took the same math test. Linda earned a lower score than Kelly, but she did not earn the lowest score. The highest test-scorer's name does not begin with an L. Madison earned a higher score than Kelly. Which person earned the lowest score on the math test?

(a) Kelly

(c) Linda

(b) Lee

(d) Madison

49. The length of a tangent from a point A at distance 5 cm from the centre of the circle is 4 cm. Find the radius of the circle.

(a) 3 cm

(c) 8 cm

(b) 7 cm

(d) 6 cm

50. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find the length of the arc

(a) 18 cm

(c) 22 cm

(b) 19 cm

(d) 11 cm

Answers:

1. b   2. a   3. d   4. b   5. c   6. d

7. a   8. c   9. c   10. b   11. a   12. c

13. d   14. b   15. a   16. c   17. c   18. d

19. c   20. a   21. d   22. d   23. b   24. a

25. b   26. c   27. a   28. d   29. b   30. a

31. c   32. b   33. d   34. d   35. b   36. a

37. c   38. a   39. b   40. b   41. c   42. a

43. d   44. d   45. c   46. a   47. b   48. b

49. a   50. c