1. The kinetic energy of a car can be described by the function $K.E = (1/2)mv^2$, in which the constant m is the mass of the car and v is the car's velocity. If the velocity keeps increasing, the kinetic energy will

(a) remain constant

(b) continually increase

(c) increase and then become constant

(d) decrease to zero

2. Lily wants to complete at least of her algebra problems by 8 P.M. If she has x algebra problems to complete, which inequality can Lily use to determine y, the number of algebra problems she wants to complete by 8 P.M.?

(a) $y \geq x-(2/3)$

(b) $y < x+(2/3)$

(c) $y < (2/3)x$

(d) $y \geq (2/3)x$

3. If y is a function of x in the equation, $y=(1/2)x+9$, which statement is true?

(a) The dependent variable y is 9 more than (1/2) the independent variable x

(b) The independent variable y is 9 more than (1/2) the dependent variable x

(c) The dependent variable x is 9 more than (1/2) the independent variable y

(d) The independent variable x is 9 more than (1/2) the dependent variable y

4. Given the function $f(x) = 3x^2 - 7$, what is the value of f(-3)?

(a) 30

(c) 20

(b) 60

(d) 50

5. What is the slope of the line described by the equation $8x + 12y = -18$?

(a) -5/3

(c) 5/3

(b) -2/3

(d) 1/3

6. The cost of renting a car for 1 day at Cars Plus is $20 plus 10 cents per mile driven. The cost of renting a car for 1 day at Need-A-Car is $20 plus 15 cents per mile driven. In a graph of the cost of a car rental, what does the cost per mile driven represent?

(a) The x- intercept

(b) The y- intercept

(c) The slope

(d) The point of intersection

7. The ordered pairs in the table are contained in the graph of a linear function.

x	y
–9	4
–6	2
6	–6
9	–8

(a) x – intercept : (2,0) and y- intercept : (0,-3)

(b) x – intercept : (0,-3) and y- intercept : (-2,0)

(c) x – intercept : (0, 2) and y- intercept : (-3,0)

(d) x – intercept : (-3,0) and y- intercept : (0,-2)

8. The amount of chlorine, y, needed for a swimming pool varies directly with the amount of water, x, needed to fill the pool. If 16 units of chlorine are needed for every 1250 gallons of water, which of the following represents the equation of direct variation?

(a) $y = (8/625)x$

(b) $y = (16/125)x$

(c) $y = (625/8)x$

(d) $y = (125/16)x$

9. Joan went to a department store to buy a sweater that was on sale for 25% off the original price, p. Which equation can be used to determine s, the sale price of the sweater, not including tax?

(a) $s = p + 0.75p$

(b) $s = p + 0.25p$

(c) $s = p - 0.75p$

(d) $s = p - 0.25p$

10. If $(-7, y)$ is a solution to the equation $2x - 7y - 42 = 0$, what is the value of y?

(a) -2

(b) -5

(c) -8

(d) -6

11. The perimeter of a rectangular volleyball court is 180 feet. The court's width, *w*, is half its length l . Which system of linear equations could be used to determine the dimensions, in feet, of the volleyball court?

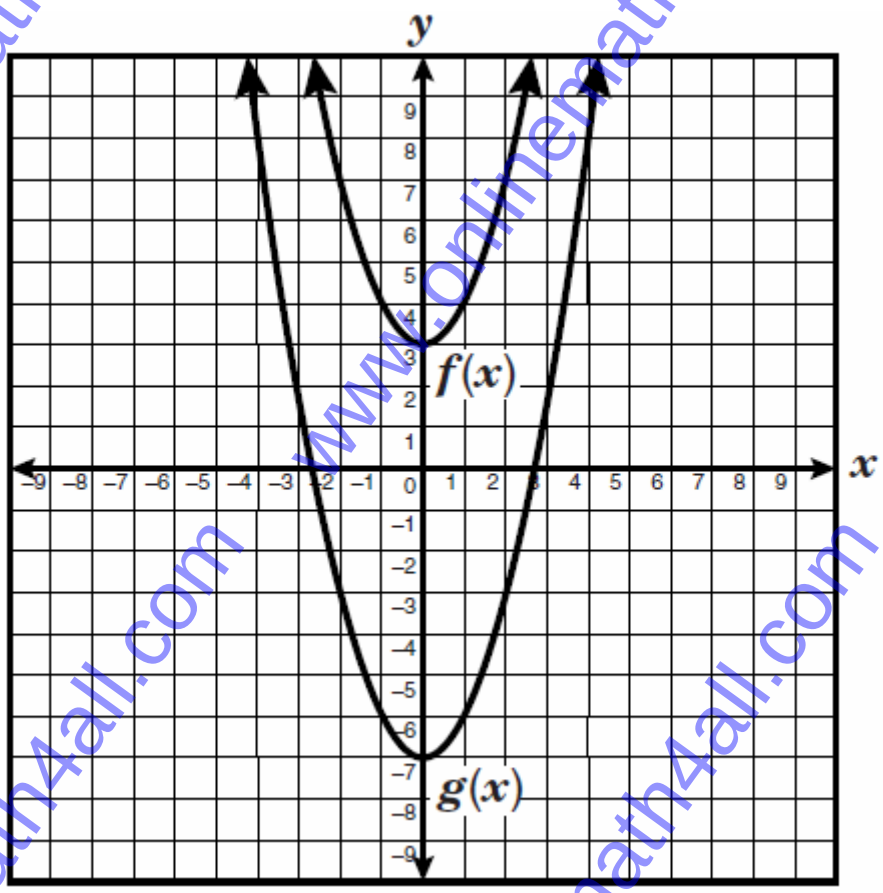
(a) l+w =180, w = (1/2)l

(b) 2l+2w =180, w = (1/2)l

(c) l+w =180, l = (1/2)w

(d) 2l+2w =180, l = (1/2)w

12. The graphs of $f(x)$ and $g(x)$ are shown on the grid below.



If $f(x) = x^2+3$, what is the equation for $g(x)$?

(a) x^2+7

(b) $x^2+ 2.5$

(c) x^2-4

(d) x^2-7

13. Which expression is equivalent to $(-5abc^4)(-3a^3c^2)(-4a^2b^4c^3)$?

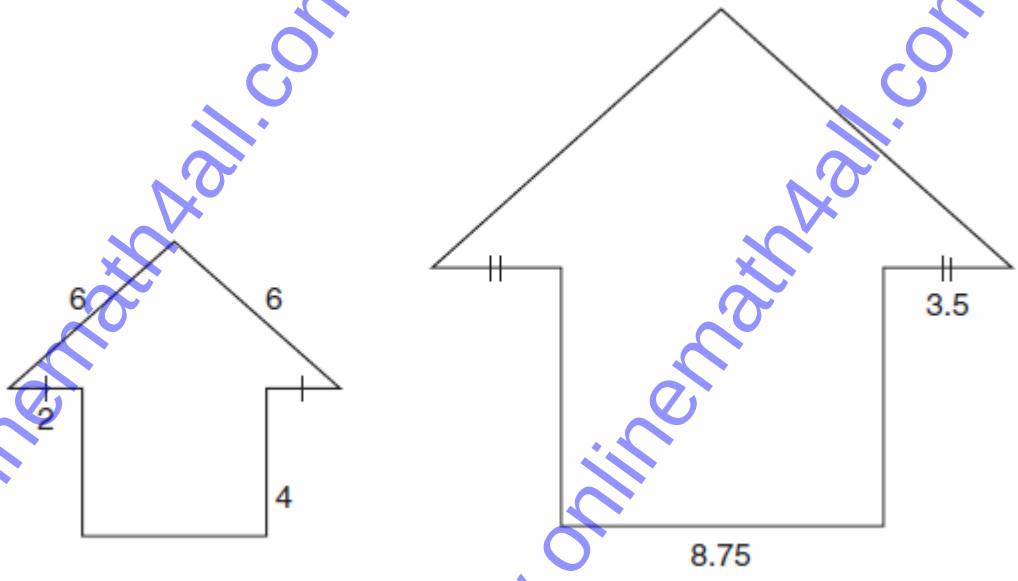
(a) $-12a^6b^5c^9$

(c) $-60a^6b^5c^9$

(b) $-12a^6b^4c^{24}$

(d) $-60a^9b^9c^9$

14. The two figures shown below are similar.



Which scale factor was used to transform the smaller figure to the larger figure?

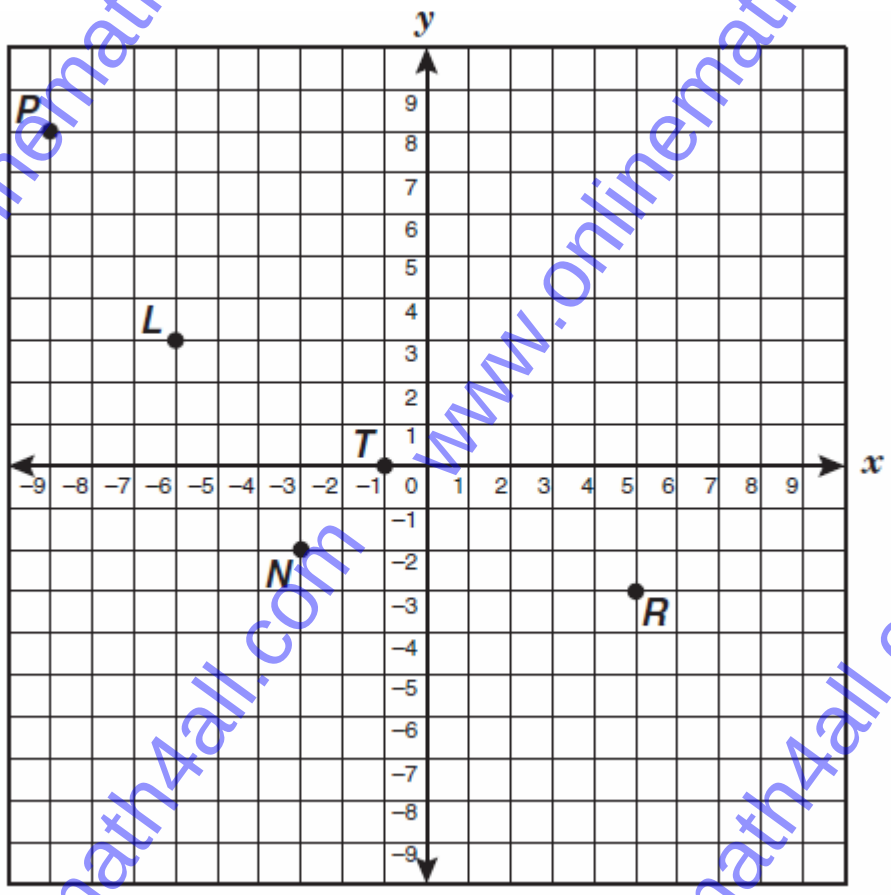
(a) 7/4

(c) 3/8

(b) 2/7

(d) 3/11

15. Point L under the translation (x+5, y-3) becomes point L'.



Which point on the grid will have the same coordinates as point L'?

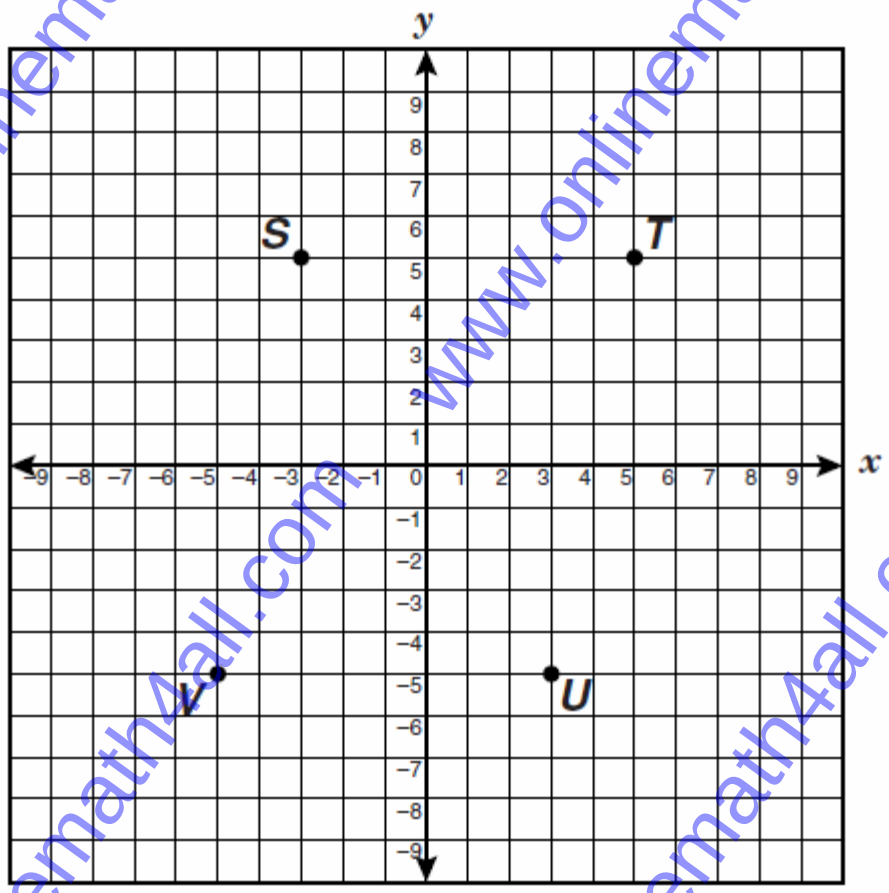
(a) P

(b) T

(c) R

(d) N

16. Which point on the graph satisfies the conditions x>3/2 and y>5/2?



(a) S

(b) V

(c) U

(d) T

17. The dimensions on the blueprints of Mrs. Dunn's house are proportional to the house's actual dimensions. The blueprints show the house's rectangular foundation to be 5.5 inches wide by 9 inches long. If the foundation actually measures 36 feet long, what is the width in feet of the actual foundation?

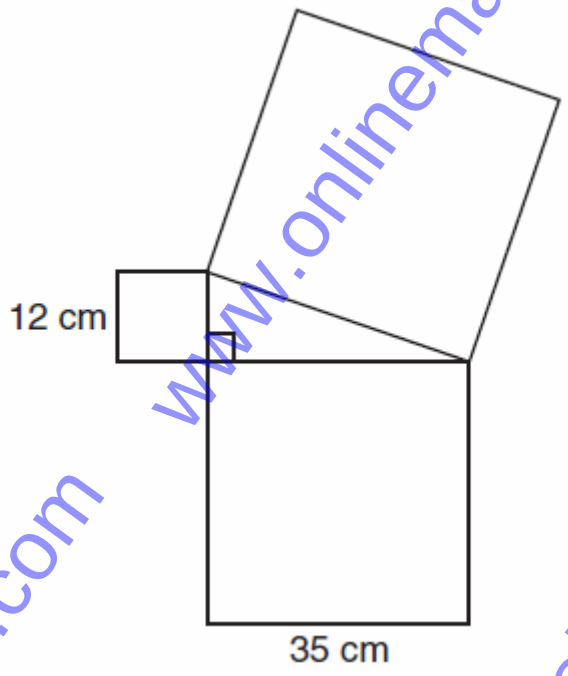
(a) 22

(b) 33

(c) 44

(d) 55

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



What is the area in square centimeters of the largest square?

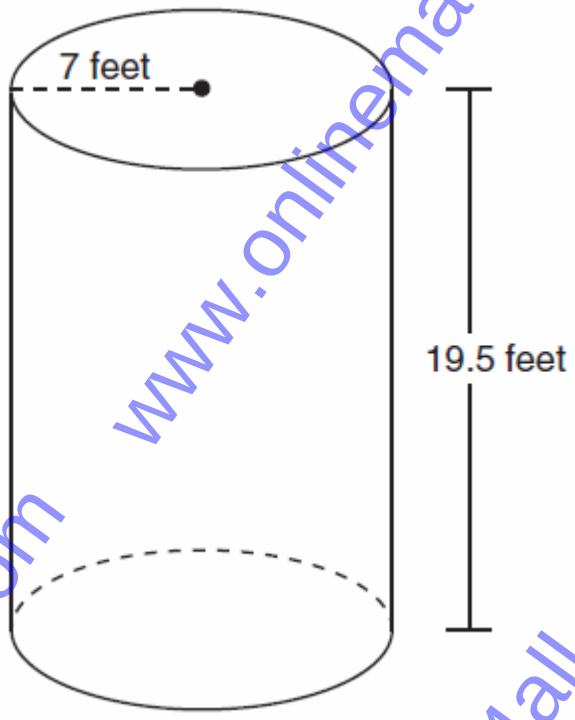
(a) 1296 cm^2

(c) 1269 cm^2

(b) 1369 cm^2

(d) 1396 cm^2

19. Look at the cylinder shown below.



What is the total surface area of this cylinder in terms of π?

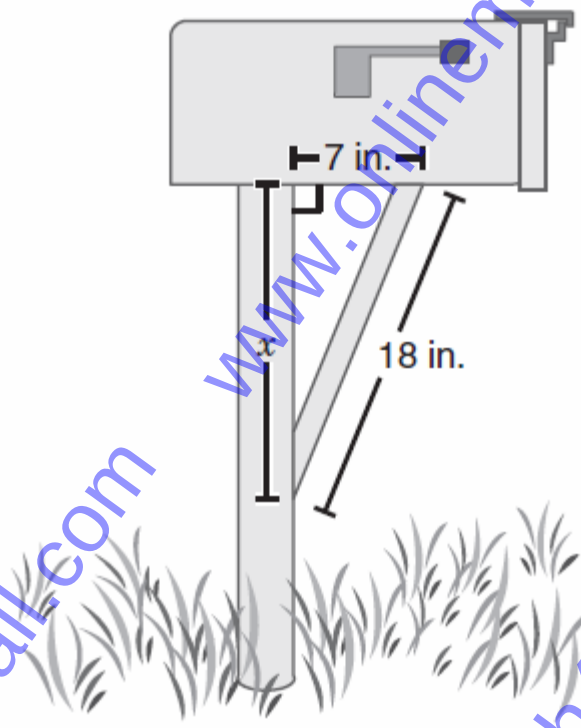
(a) 368π square feet

(b) 369π square feet

(c) 370π square feet

(d) 371π square feet

20. The drawing below shows Jeremy's mailbox and the brace he used to secure it to the post.



If the length of the brace is approximately 18 inches, which is closest to x, the distance between the bottom of the mailbox and the point on the post where Jeremy secured the brace?

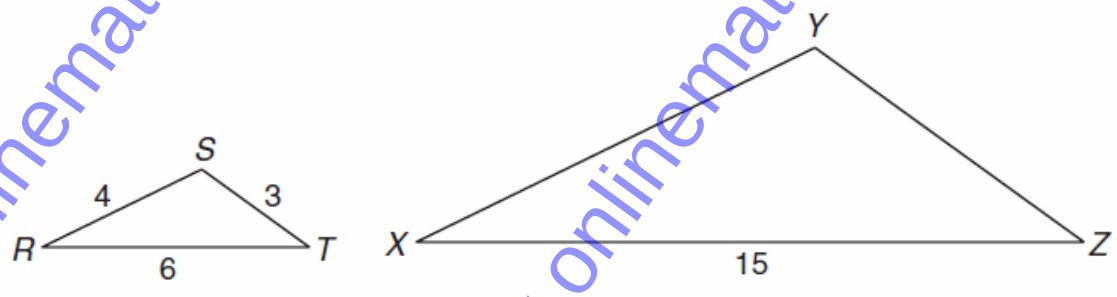
(a) 15 inches

(b) 16 inches

(c) 17 inches

(d) 18 inches

21. What is the length of YZ if the triangle RST is similar to the triangle XYZ?



(a) 7.5 units

(c) 6.5 units

(b) 5.5 units

(d) 8.5 units

22. If the dimensions of a rectangle are tripled, which of the following best describes an effect on the rectangle?

(a) The new area will be 3 times as large as the original area.

(b) The new area will be 9 times as large as the original area.

(c) The new perimeter will be 1.5 times as large as the original perimeter.

(d) The new perimeter will be 9 times as large as the original perimeter

23. On a weekly basis Tara sets aside 1/2 of her weekly salary for rent, 1/5 for credit card payments, 1/4 for groceries and utilities, and the rest, approximately $15, for entertainment. Which of the following is closest to Tara's weekly salary?

(a) $200

(b) $250

(c) $300

(d) $350

24. During a softball game Kendra threw 85 pitches, 34 of which the umpire called strikes. What percent of Kendra's pitches did the umpire not call strikes?

(a) 25%

(b) 38%

(c) 20%

(d) 60%

25. The table below shows the highest and lowest points in elevation for 5 of the 7 continents.

Highest and Lowest Continental Altitudes

Continent	Highest Point (elevation in feet)	Lowest Point (elevation in feet)
Asia	29,035	–1,340
Africa	19,340	–512
Europe	18,510	–92
North America	20,320	–282
South America	22,834	–131

Based on the information in the table, which of the following statements is true?

(a) Asia's lowest point is more than 3 times lower than Africa's lowest point.

(b) North America's highest point is more than 2,000 feet higher than South America's highest point.

(c) Asia's highest point is more than 1.5 times as high as Europe's highest point.

(d) Europe has the lowest point of all 5 continents.

26. A group of girls is attempting to break the school record for the longest gum-wrapper chain. The girls' chain already measures 4182 feet. The school-record chain is 5967 feet. What additional information is needed to determine how many gum wrappers the girls still need in order to break the record?

(a) The amount of time it took to complete the current school-record chain

(b) The number of gum wrappers each girl has collected

(c) The number of gum wrappers needed to complete a foot of the chain

(d) The amount of time needed to complete the chain

27. If $x > 0$ and $y < 0$, which statement must be true for the expression x/y?

(a) The result of the expression is undefined.

(b) The result of the expression is 0.

(c) The result of the expression is negative.

(d) The result of the expression is positive.

28. Which of the following is true of all squares and all rectangles?

I. All squares and all rectangles are equilateral.
II. All squares and all rectangles are equiangular.
III. All rectangles are squares.

(a) II only

(b) III only

(c) II and III only

(d) I, II and III

29. Find (2.525252……) + (2.52222……) in the integer by integer form.

(a) 4997/999

(b) 4997/990

(c) 4997/991

(d) 4999/990

30. Simplify the following.

$$3\sqrt[3]{128}-\sqrt[3]{2000}$$

(a) $3\sqrt[3]{3}$

(b) $3\sqrt[3]{2}$

(c) $2\sqrt[3]{3}$

(d) $2\sqrt[3]{2}$

31. Find the value of (x^2+y^2), if

$$\frac{\sqrt{3}-1}{\sqrt{3}+1}+\frac{\sqrt{3}+1}{\sqrt{3}-1}=x+y\sqrt{3}$$

(a) 25

(c) 16

(b) 41

(d) 32

32. Find the perimeter of the circular land whose area is that of a rectangular land of dimensions 22 cm × 14 cm.

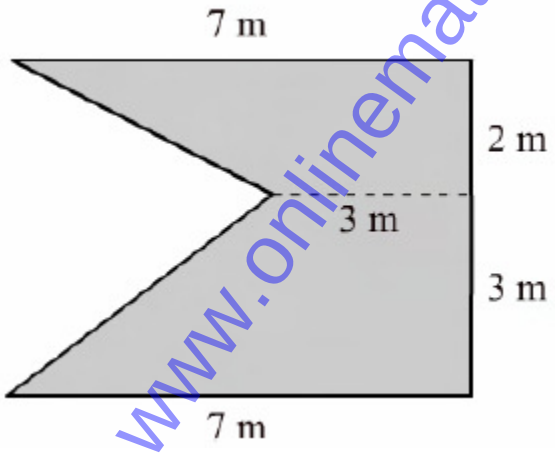
(a) 29.22 cm

(c) 62.22 cm

(b) 45.22 cm

(d) 56.22 cm

33. Find the area of the shaded region in the following figure.



(a) 25 m^2

(c) 16 m^2

(b) 56 m^2

(d) 42 m^2

34. Evaluate : $\log_3 (243)^{-1}$

(a) -3

(c) 3

(b) 5

(d) -5

35. Simplify:

$$\log_5 8 + \log_5 \frac{1}{1000}$$

(a) 3 m

(c) 2

(b) -3

(d) -2

36. Evaluate the following:

$$\frac{\sqrt{24.71 \times 84.3}}{16.94 \times 3.23}$$

(a) 0.6339

(c) 0.8339

(b) 0.7339

(d) 0.9339

37. Find the cardinal number of the following set.

$$\{x \mid -3 \leq x < 4, x \in Z\}$$

(a) 4

(c) 6

(b) 7

(d) 5

38. If $U = \{1, 2, 3, 4, 5\}$ and $A = \{3, 4\}$, find A^c

(a) {3, 4}

(b) {1, 2, 3}

(c) {1, 2, 3, 4, 5}

(d) {1, 2, 5}

39. A college magazine reported that 150 students had combined membership in physics club and mathematics club. Find the membership in physics club if 70 students were members of the mathematics club and 50 students were members of both the clubs.

(a) 130

(b) 90

(c) 89

(d) 129

40. If the values of $a + b$ and ab are 12 and 32 respectively, find the values of a^2+b^2 and $(a-b)^2$.

(a) 14, 92

(b) 12, 69

(c) 15, 79

(d) 80, 16

41. Find the angles, if the angles are supplementary and the larger is twice the small.

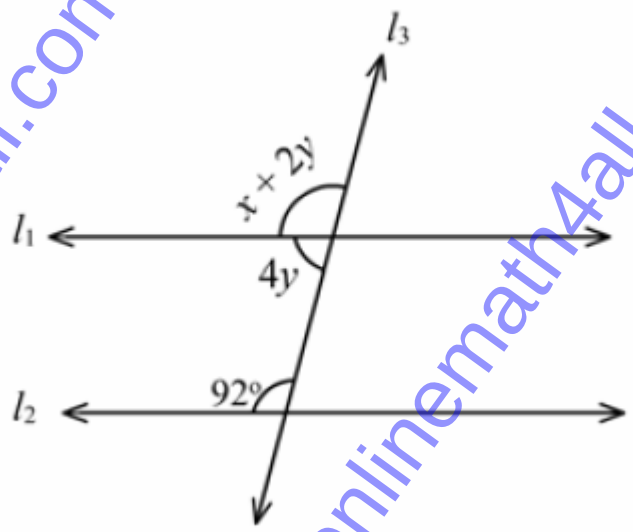
(a) 60°, 180°

(c) 60°, 120°

(b) 30°, 60°

(d) 40°, 80°

42. Find the angles x and y in the below figure where the lines l_1 and l_2 are parallel and l_3 is a transversal to l_1 and l_2.



(a) 60°, 18°

(c) 56°, 12°

(b) 34°, 60°

(d) 48°, 22°

43. If the slope of the line is undefined, then the line is

(a) rising line

(c) falling line

(b) parallel to y-axis

(d) parallel to x- axis

44. Find the equation of the line slope having slope 1/2 and y-intercept is -3.

(a) x-2y-6=0

(c) x-2y+6=0

(b) x+2y-6=0

(d) x+2y+6=0

45. The points (3,-2), (2,5) and (8,-7) form a

(a) Scalene triangle

(c) Isosceles triangle

(b) Equilateral triangle

(d) Right triangle

46. In triangle ABC, angle B = 90°, AB = 8 cm, AC = 17 cm. Find cotC

(a) 10/7

(c) 5/3

(b) 7/9

(d) 15/8

47. In how many ways, 10 men be divided in to 2 groups of 4 and 6 men respectively?

(a) 210 ways

(c) 513 ways

(b) 790 ways

(d) 158 ways

48. Find the median for the marks of 40 students.

Marks	24	20	35	52	50	48
No. of students	4	7	3	9	5	12

(a) 29

(c) 48

(b) 14

(d) 56

49. An unbiased die is tossed. Find the probability of getting a multiple of 3.

(a) 5/9

(b) 1/3

(c) 7/8

(d) 5/7

50. A number when divided by 6 leaves a remainder 3. When the square of the same number is divided by6, the remainder is

(a) 5

(b) 8

(c) 2

(d) 3

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