

1. Multiply 3.4×10^{-5} by 7.1×10^8 and leave the answer in standard form.
A. 2.414×10^2
B. 2.414×10^3
C. 2.414×10^4
D. 2.414×10
2. Given that $P = \{p: 1 < p < 20\}$, where p is an integer and $R = \{r: 0 \leq r \leq 25, \text{ where } r \text{ is a multiple of } 4\}$. Find $P \cap R$
A. $\{4, 8, 10, 16\}$
B. $\{4, 8, 12, 16\}$
C. $\{4, 8, 12, 16, 20\}$
D. $\{4, 8, 12, 16, 20, 24\}$
3. The first term of an Arithmetic Progression (A.P) is 2 and the last term is 29. If the common difference is 3, how many terms are in the A.P.?
A. 8
B. 9
C. 10
D. 11
4. Express in index form: $\log_x a + \log_y a = 3$
A. $x + y = 3$
B. $xy = 3$
C. $xy = a^3$
D. $x + y = a^3$
5. Simplify: $(2p - q)^2 - (p + q)^2$
A. $3p(p - 2q)$
B. $2p(p - 3q)$
C. $3p(2p - q)$
D. $2p(3p - q)$

6. If $(3 - 42 - v)(1 + 32 - v) = a + b2 - v$, find the value of b

- A. -5
- B. 5
- C. -21
- D. 21

7. Find the sum for which \$ 1,250.00 will amount to \$ 2,031.25 at 12.5% per annum simple interest.

- A. 2 years
- B. 3 years
- C. 4 years
- D. 5 years

8. If $\log_2 x - 13 = 5$, find the value of x

- A. 8
- B. 16
- C. 64
- D. 122

9. The population of a town increases by 3% every year. In the year 2000, the population was 3000. Find the population in the year 2003.

- A. 3,182
- B. 3,278
- C. 6,591
- D. 7,515

10. A trader gave a change of # 540.00 instead of # 570.00 to a customer. Calculate the percentage error.

- A. 5519%

- B. 559%
- C. 5719%
- D. 579%

11. The interior angle of a regular polygon is 168° . Find the number of sides of the polygon.

- A. 24
- B. 30
- C. 15
- D. 12

12. If $3x - 2y = -5$ and $x + 2y = 9$, find the value of $x - y$.

- A. 53
- B. 35
- C. -35
- D. -53

13. A variable W varies partly as M and Partly inversely as P . Which of the following **correctly** represents the relation with k_1 and k_2 constants?

- A. $W = k_1 M k_2 P$
- B. $W = (k_1 + k_2) M P$
- C. $W = k_1 M + k_2 P$
- D. $W = (k_1 + k_2) M + P$

14. A cylindrical metallic barrel of height 2.5m and radius 0.245 is closed at one end. Find, correct to one decimal place, the total surface area of the barrel (Take $\pi = 227$)

- A. 2.1 m²
- B. 3.5 m²
- C. 4.0 m²

D. 9.4 m

15. Make R the subject of the relation $V = \pi l(R^2 - r^2)$

A. $R = \sqrt{\frac{V}{\pi l} + r^2}$

B. $R = \sqrt{\frac{V}{\pi l} - r^2}$

C. $R = \sqrt{\frac{V}{\pi l} r^2}$

D. $R = \sqrt{\frac{V}{\pi l} r^2}$

16. Consider the following statements:

m = Edna is respectful

n = Edna is brilliant,

If $m \Rightarrow n$, which of the following is valid?

A. $\neg n \Rightarrow \neg m$.

B. $\neg m \Rightarrow \neg n$.

C. $n \Rightarrow \neg m$.

D. $m \Rightarrow n$.

17. A number is added to both the numerator and the denominator of the fraction $\frac{18}{18}$ if the result is $\frac{12}{12}$, find the number.

A. 3

B. 4

C. 5

D. 6

18. Gifty, Justina, and Frank shared 60 oranges in the ratio 5: 3: 7 respectively. How many oranges did Justina receive?

A. 16

B. 12

C. 20

D. 28

19. Find the quadratic equation whose roots are 23 and - 1

A. $3x^2 - x - 2 = 0$

B. $3x^2 + x + 2 = 0$

C. $3x^2 + x - 2 = 0$

D. $3x^2 + x - 1 = 0$

20. A piece of rod of length 44 m is cut to form a rectangular shape such that the ratio of the length to the breadth is 7: 4. Find the breadth.

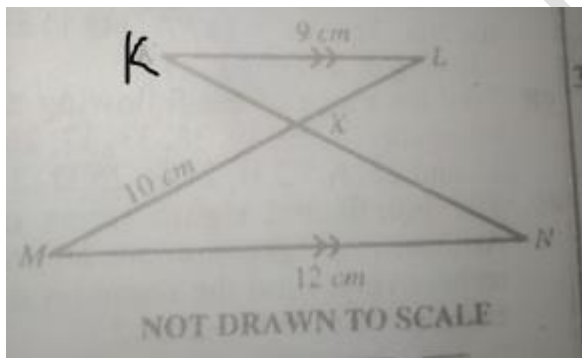
A. 8m

B. 14m

C. 16m

D. 24m

21.



In the diagram above, $MN \parallel KL$, ML and KN intersect at X.
 $|MN| = 12\text{cm}$, $|MX| = 10\text{cm}$ and $|KL| = 9\text{cm}$. If the area of $\triangle MXN$ is 16cm^2 , calculate the area of $\triangle LKX$

A. 9cm^2

B. 8cm^2

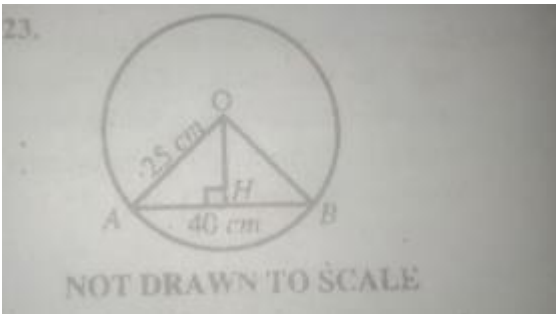
C. 10cm^2

D. 12cm^2

22. A ladder 15 m long leans against a vertical pole, making an angle of 72° with the horizontal. Calculate, correct to one decimal place, the distance between the foot of the ladder and the pole.

- A. 15.8 m
- B. 14.3 m
- C. 4.9 m
- D. 4.6 m

23.



In the diagram above, O is the centre of the circle. If $|OA| = 25$ cm and $|AB| = 40$ cm, find $|OH|$

- A. 15 cm
- B. 20 cm
- C. 25 cm
- D. 30 cm

24. A car valued at \$ 600,000.00 depreciates by 10% each year. What will be the value of the car at the end of two years?

- A. \$ 120,000.00
- B. \$ 480,000.00
- C. \$ 486,000.00
- D. \$ 540,000.00

25. Given that P is 25 m on a bearing of 330° from Q, how far south of P is Q?

- A. 25.2 m
- B. 21.7 m
- C. 19.8 m

D. 18.5 m

26. The length and breadth of a cuboid are 15 cm and 8 cm respectively. If the volume of the cuboid is 1560 cm^3 , calculate the total surface area.

A. 976 cm^2

B. 838 cm^2

C. 792 cm^2

D. 746 cm^2

27. The number 1621 was subtracted from 6244 in base x . If the result was 4323, find x .

A. Seven

B. Eight

C. Nine

D. Ten

28. Factorize completely: $27x^2 - 48y^2$

A. $3(3x + 4y)(3x - 4y)$

B. $3(3x + 4y)(3x + 4y)$

C. $3(9x - 16y)(9x + 16y)$

D. $3(9x - 16y)(9x - 16y)$

29. For what values of x is $x - 34 + x + 18 \geq 2$?

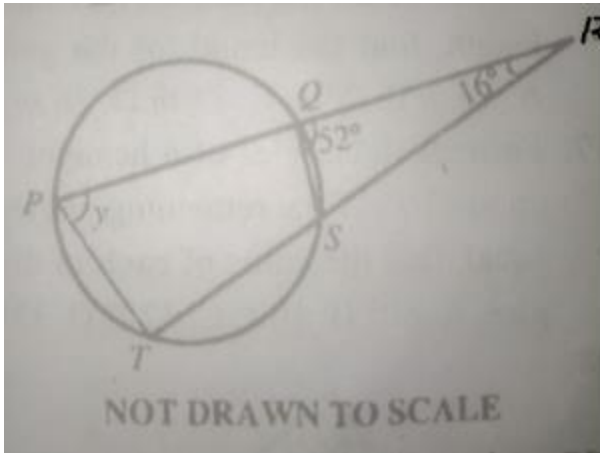
A. $x \geq 5$

B. $x \geq 6$

C. $x \geq 7$

D. $x \geq 8$

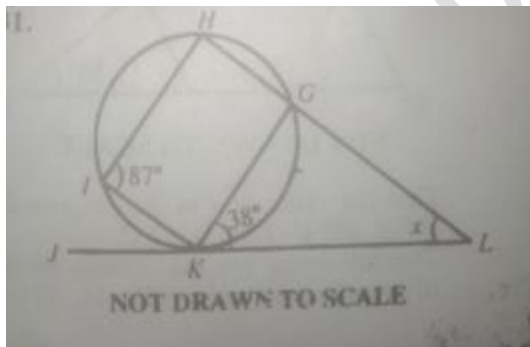
30.



In the diagram above, $\angle SQR = 52^\circ$ and $\angle PRT = 16^\circ$. Find the value of the angle marked y

- A. 640
- B. 680
- C. 1120
- D. 1280

31.



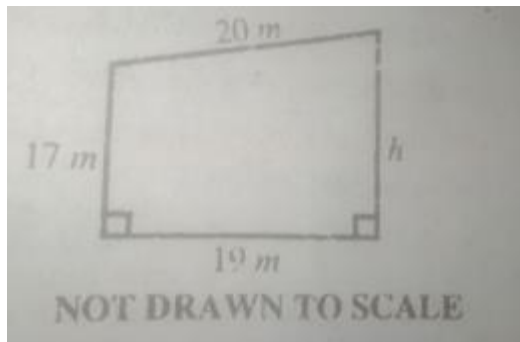
In the diagram above, JKL is a tangent to the circle GHIK at K.

- A. 93°
- B. 55°
- C. 42°
- D. 23°

32. A cone and a cylinder are of equal volume. The base radius of the cone is twice the radius of the cylinder. What is the ratio of the height of the cylinder to that of the cone?

- A. 5: 4
- B. 4: 3
- C. 3: 2
- D. 3: 4

33.



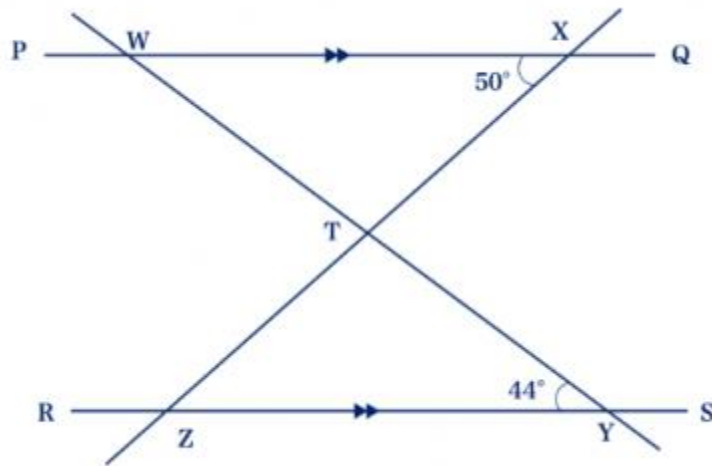
Find, correct to the **nearest** whole number, the value of h in the diagram above.

- A. 15 m
- B. 22 m
- C. 23 m
- D. 18 m

34. The gradient of the line joining the points $P(2, -8)$ and $Q(1, y)$ is -4 . Find the value of y

- A. 2
- B. 4
- C. -4
- D. -3

35.



In the diagram above, $PQ \parallel RS$, $\angle WYZ = 44^\circ$ and $\angle WXY = 50^\circ$. Find $\angle WTX$

- A. 65°
- B. 68°
- C. 86°
- D. 90°

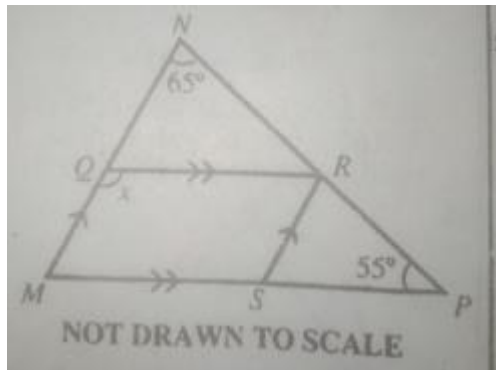
36. The perimeter of a rectangular garden is 90 m. If the width is 7 m less than the length, find the length of the garden.

- A. 19 m
- B. 23 m
- C. 24 m
- D. 26 m

37. Four of the angles of a hexagon sum up to 420° . If the remaining angles are equal, find the value of each of the angles.

- A. 600
- B. 1000
- C. 1200
- D. 1500

38.



Find the value of x in the diagram above.

- A. 120°
- B. 100°
- C. 60°
- D. 150°

39. The following are the masses (in kg) of members in a club: 59, 44, 53, 49, 57, 40, 48, and 50. Calculate the mean mass.

- A. 44 kg
- B. 50 kg
- C. 40 kg
- D. 53 kg

40. The following are the masses (in kg) of members in a club: 59, 44, 53, 49, 57, 40, 48, and 50. Calculate the variance of the distribution.

- A. 35
- B. 36
- C. 40
- D. 50

41. Two opposite sides of a rectangle are $(5x + 3)$ m and $(2x + 9)$ m. If an adjacent side is $(6x - 7)$ m, find in m^2 , the area of the rectangle.

- A. 45

- B. 65**
- C. 125**
- D. 165**
- D. 165**

42. A die is tossed once. Find the probability of getting a prime number.

- A. 12**
- B. 16**
- C. 13**
- D. 23**

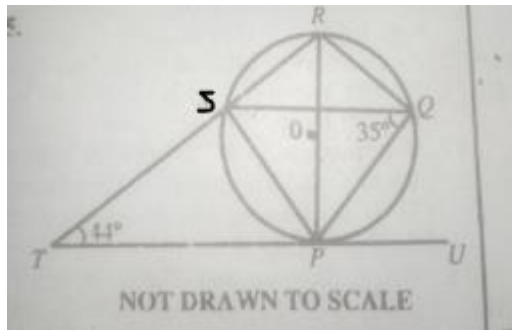
43. The area of a sector of a circle with radius 7cm is 51.3 cm^2 . Calculate, correct to the nearest whole number, the angle of the sector. (Take $\pi = 227$)

- A. 600**
- B. 1200**
- C. 1500**
- D. 1500**

44. A cliff on the bank of a river 87 m high. A boat on the river is 22 m away from the cliff. Calculate, correct to the nearest degree, the angle of depression of the boat from the top of the cliff.

- A. 76o**
- B. 64o**
- C. 36o**
- D. 24o**

45.



In the diagram TU is a tangent to the circle SPQR at P. If $\angle PTS = 44^\circ$, $\angle SQP = 35^\circ$, find $\angle PST$

- A. 101°
- B. 125°
- C. 130°
- D. 135°

46. The probability that Amaka will pass an examination is $\frac{3}{7}$ and that Bala will pass is $\frac{4}{9}$. Find the probability that both will pass the examination.

- A. $\frac{2}{21}$
- B. $\frac{4}{21}$
- C. $\frac{5}{21}$
- D. $\frac{9}{21}$

47. Which of the following points lies on the line $3x - 8y = 11$?

- A. (1, 1)
- B. (1, -1)
- C. (-1, 1)
- D. (-1, -1)

48. Find the range of the following set of numbers: 28, 29, 39, 38, 33, 37, 26, 20, 15, and 25.

- A. 22
- B. 24

C. 25

D. 27

49. The fourth and eighth terms of an Arithmetic Progression are 16 and 40 respectively. Find the common difference.

A. - 6

B. 6

C. -2

D. 2

50. For what values of y is $y+28y^2-10y+3$ not defined?

A. -34, 12

B. -34, -12

C. 34, 12

D. 34, -12

51. The time(t) taken to buy fuel at a filling station varies directly as the number of vehicles(V) in a queue and varies inversely as the number of pumps (P), available at the station. In a station with 5 pumps, it took 10 minutes to fuel 20 vehicles. find the;

(a) relationship between t , P , and V ;

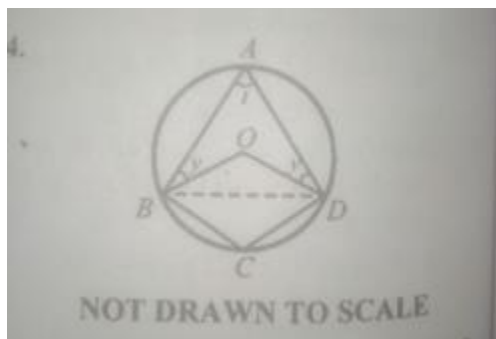
(b) time it takes to fuel 50 vehicles at a station with 2 pumps;

(c) number of pumps required to fuel 40 vehicles in 20 minutes.

52. A car travelled at a distance of $(2x + 13)$ km at 67.5 km/h and $(5x - 20)$ km at 72 km/h. If the total time for the entire journey was 90 minutes, find the value of x .

53. A circular floor of a building is to be tiled with ceramic tiles each of side 40 cm. If the perimeter of the floor is 66 m, calculate, correct to the nearest whole number, the number of tiles required to completely tile the floor.[take $\pi = 227$]

54.



In the diagram, ABCD is a circle O. The quadrilateral OBCD is a rhombus such that $\angle ADO = \angle OBA = y$ and $\angle BAD = t$. Find;

(a) the value of t ;

(b) the value of y ;

(c) $\angle ADC$.

55. A basket contains 3 gold-plated marbles, 4 diamond marbles, and some silver marbles, all of the same size and shape. Two marbles were drawn from the basket at random one after the other without replacement. If the probability that the two marbles were all silver is $\frac{1}{15}$, find the number of silver marbles.

SECTION B

56. Given that $(x + 2)$, $(4x + 3)$, and $(7x + 24)$ are consecutive terms of a Geometric Progression (G.P.), find the:

a) value of x

b) common ratio.

57.

AGE	5	6	7	8	9	10
FREQUENCY	2	$2x - 1$	$y + 2$	4	2	$y - 1$

The table shows the ages of 20 children in a household.

Given that $x : y = 1 : 2$

(a) values of x and y

(b) mean ages of the children.

58. Two observers Abu and Badu, 46 m apart, observe a bird on a vertical pole from the same side of the bird. The angles of elevation of the bird from Abu's and Badu's eye are 40° and 48° respectively. If at the foot of the pole Abu and Badu are on same horizontal;

(a) illustrate the information in a diagram;

(b) calculate, correct to one decimal place, the height of the pole.

59. The diameter of a circle centre O is 26 cm. If a chord PQ is drawn such that it is 5 cm from O to the centre of the chord, calculate, correct to the nearest whole number, the

(a) $\angle POQ$

(b) Area of the minor segment formed by the chord PQ . [take $\pi = 227$]

60. (a) In a man's will, he gave 25 of the total acres of the farm to the wife and 13 of what is left to the family. The rest of the farm was to be shared amongst his three children in the ratio 3: 5: 2. Given that, the child who had the least share received 8 acres, calculate the:

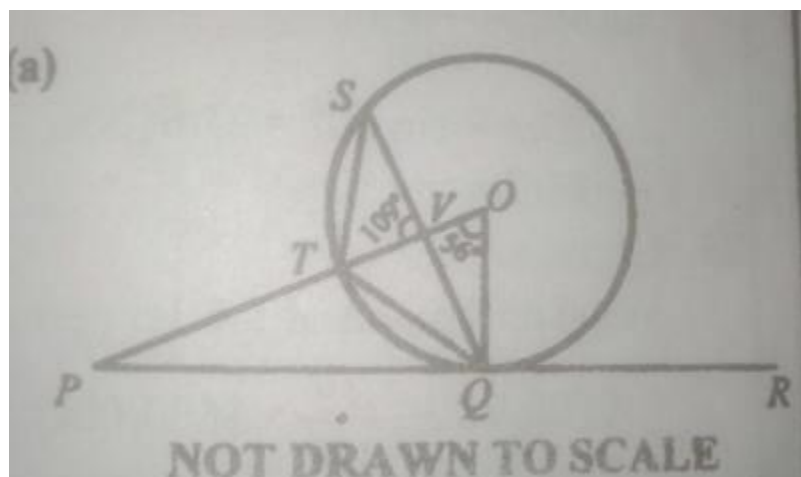
(i) total acres the man left.

(ii) number of acres the wife received.

(b) The price of a Television set is \$1,600.00. It can be purchased by a deposit of \$400.00 and the rest of the amount paid by 12 monthly installments at 25% per annum simple interest. If the Television set is purchased by installment, find the total cost.

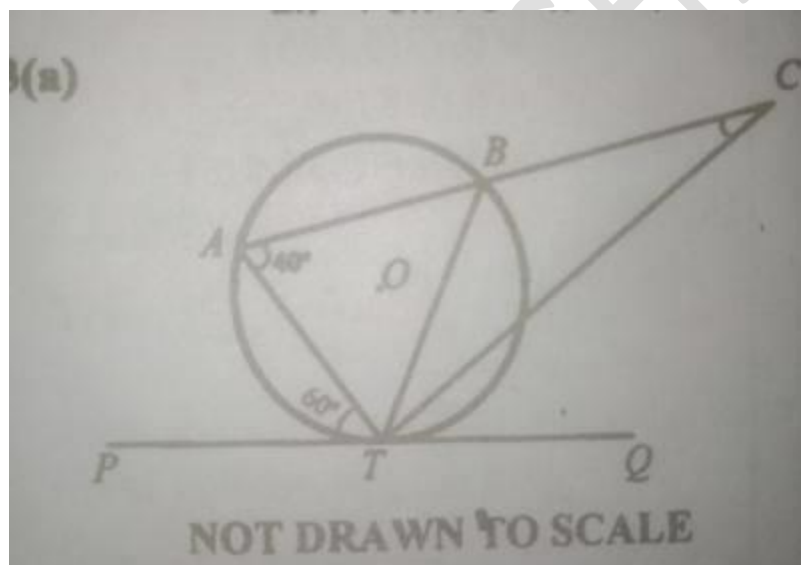
61. (a) Find the equation of the line that passes through the origin and the point of intersection of the lines $x+2y=7$ and $x-y=4$. (b) The ratio of an interior angle to an exterior angle of a regular polygon is 4: 1. Find the: (i) number of sides; (ii) value of the exterior angle; and (iii) sum of the interior angles of the polygon.

62.



- (a) In the diagram above, PR is a tangent to the circle O at Q . $\angle POQ = 56^\circ$ and PO intersect SO at V such that $\angle SVP = 109^\circ$. Calculate: (i) $\angle TQP$ (ii) $\angle QTS$
- (b) Simplify $2n^2 - 3n - 22n^2 + 3n + 1 \times n^2 - 1n^2 - 4$

63.



- (a) In the diagram above, ABT is a circle centre O . PQ is a tangent to the circle at T and ABC is a straight line. TC bisects $\angle BTQ$, $\angle BAT = 44^\circ$ and $\angle PTA = 60^\circ$. Find $\angle ACT$
- (b) The circumference of the base of a cylindrical tank is 11 m. The height of the tank is 3 m more than 6 times the base radius. Calculate the:
- (i) radius; (ii) height; (iii) volume of the tank

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