Answer **all** *the questions.*

Mathematical tables may be used in **any** *question. The use of non-programmable, silent and cordless calculator is allowed.*

Each question is followed by **four** *options lettered* A *to* D. *Find the* **correct** *option for* **each** *question and shade in* **pencil**, *on your answer sheet, the answer space which bears the same letter as the option you have chosen.*

Give only **one** *answer to* **each** *question. An example is given below.*

The ages, in years, of four boys are 10, 12, 14 and 18. What is the average age of the boys?

A. 12 years
B. 12½ years
C. 13 years
D. 13½ years

The correct answer is 13½ years, *which is lettered* D, *and therefore answer space* D *would be shaded.* ⊏A⊐ ⊏B⊐ ⊏C⊐ ■D

Think carefully before you shade the answer spaces; erase completely any answers you wish to change.

Do all rough work on this question paper.

Now answer the following questions.

1. The sum of the interior angles of a polygon is 1260°. Find the number of sides.

A. 9
B. 6
C. 7
D. 8

2. A building is 12 m high. A football on the ground floor is 30 m away from the foot of the building. Find, correct to the **nearest** degree, the angle of depression of the ball from the top of the building.

A. 22°
B. 68°
C. 66°
D. 24°

3. A number is chosen at random from the set {13, 14, ..., 30}. What is the probability that it is a prime number?

A. $\frac{5}{16}$
B. $\frac{1}{3}$
C. $\frac{5}{18}$
D. $\frac{3}{8}$

4. Regina is 34 years old and her daughter is 5 years. In n years, Regina will be twice as old as her daughter. Find the value of n.

A. 23

B. 30

C. 29

D. 24

5. If $P(-7, 8)$ is reflected in the line $x - 2 = 0$, find the coordinates of the image of P.

A. $\begin{pmatrix} 5 \\ 8 \end{pmatrix}$

B. $\begin{pmatrix} 8 \\ -7 \end{pmatrix}$

C. $\begin{pmatrix} 11 \\ -8 \end{pmatrix}$

D. $\begin{pmatrix} 11 \\ 8 \end{pmatrix}$

6. If the variable P is inversely proportional to Q^2 and $P = 2.25$ when $Q = 6$, find P when $Q = 3$.

A. 9.5

B. 7.5

C. 8.5

D. 9.0

7. Make x the subject of the relation $y = \sqrt{\frac{px}{r} - r^2x}$.

A. $x = \frac{ry^2}{p - r^3}$

B. $x = \frac{p - r^3}{ry^2}$

C. $x = \frac{ry}{p - r^3}$

D. $x = \frac{y^2}{p - r^2}$

8. Seven men complete a certain work schedule in 6 days. How long will it take two of the men to complete the same work schedule if they work at the same rate?

A. 42 days

B. 35 days

C. 21 days

D. 14 days

9. If $\cos y$ is negative and $\sin y$ is negative, in which quadrant would y lie?

A. First
B. Fourth
C. Third
D. Second

10. The volume of a cone is 264 cm^3. If the base radius is 6 cm, find the height. [Take $\pi = \frac{22}{7}$]

A. 5 cm
B. 8 cm
C. 7 cm
D. 6 cm

11. Find the value of x for which $\frac{2x-1}{x^2+2x+1}$ is **not** defined.

A. $\frac{1}{2}$
B. 1
C. 2
D. -1

12. The range of a sample of 10 numbers is 5 and the largest value is 50. What is the **least** value?

A. 40
B. 60
C. 55
D. 45

13. The mean of ten numbers is 16. When another number, k, is added, the mean becomes 18. Find the value of k.

A. 38
B. 32
C. 34
D. 36

14. The probabilities that John and James pass an examination are $\frac{3}{4}$ and $\frac{3}{5}$ respectively. Find the probability that **both** will fail.

A. $\frac{1}{10}$
B. $\frac{11}{20}$
C. $\frac{9}{20}$
D. $\frac{3}{10}$

15. The diagonals of a rhombus are 12 cm and 16 cm. Find the perimeter.

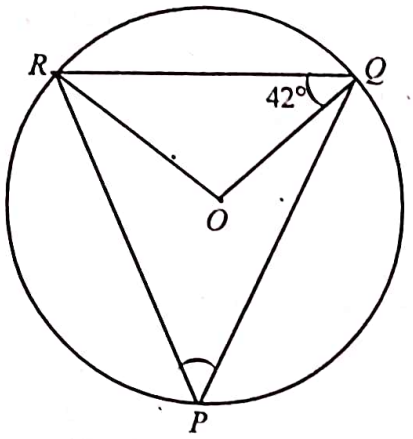
A. 42 cm

B. 24 cm

C. 28 cm

D. 40 cm

16.



NOT DRAWN TO SCALE

In the diagram PQR is a circle with centre O and $\angle OQR = 42°$. Find $\angle QPR$.

A. 42°

B 48°

C. 54°

D. 56°

17. Solve: $x(3x + 4) = 4$.

A. $x = \frac{2}{3}$ or $x = -2$

B. $x = -\frac{2}{3}$ or $x = 2$

C. $x = \frac{2}{3}$ or $x = 2$

D. $x = -\frac{2}{3}$ or $x = -2$

18. If $P = \{-2, 0, 2, 4, 6\}$ and $Q = \{-3, -1, 0, 2, 3, 5\}$, find the set $P \cap Q$.

A. $\{\ \}$

B. $\{-3, -1, 3, 5\}$

C. $\{-2, 4, 6\}$

D. $\{0, 2\}$

19. An office equipment depreciates at 15 % per annum. If the cost is GH¢ 1,200.00 when new, find the value after three years.

A. GH¢ 936.00

B. GH¢ 867.95

C. GH¢ 736.95

D. GH¢ 876.00

20. Solve: $\frac{x-2}{4} - \frac{2x-4}{3} = \frac{5}{6}$.

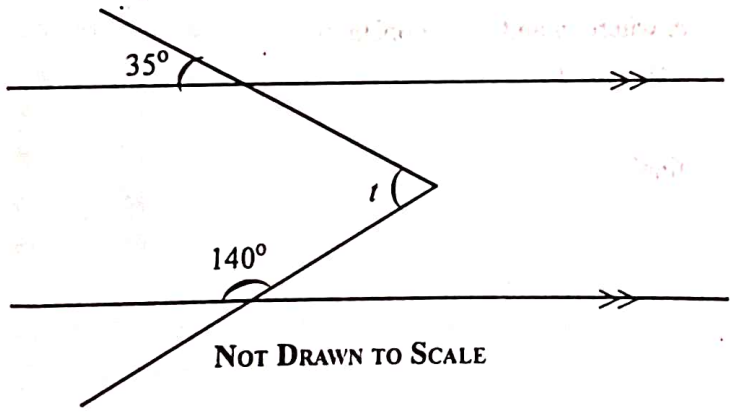
A. $x = 0$

B. $x = 5$

C. $x = 4$

D. $x = 2$

21.



NOT DRAWN TO SCALE

Calculate the value of t in the diagram.

A. 35°

B. 175°

C. 75°

D. 40°

22. Given that $6 \otimes 7 = y$ (modulo 8), find the value of y.

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

23. Express 0.0063075 correct to **three** significant figures.

A. 0.006
B. 0.0063
C. 0.00631
D. 0.0060

24. Given the statements p and q ,the statement $p \vee q$ is false only if

A. p is false and q is true.
B. p is true and q is true.
C. p is false and q is false.
D. p is true and q is false.

y	1	2	3	4
x	0	2	4	6

The table describes the relation $y = mx + c$, where m and c are constants.
Use the information to answer questions **25** *and* **26.**

25. What is the gradient of the equation of the line?

A. $\frac{1}{2}$
B. -2
C. 2
D. 1

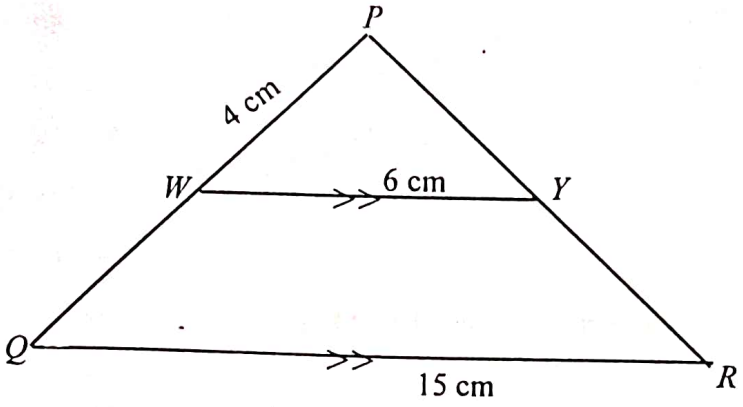
26. Find the equation of the line described in the table.

A. $y = 2x$
B. $2y = x + 2$
C. $y = x$
D. $y = x + 1$

27. The second term of a Geometric Progression (G.P) is 9. If the fourth term is 81, find the common ratio.

A. 4
B. 1
C. 2
D. 3

28.



NOT DRAWN TO SCALE

In the diagram, ΔPQR is similar to ΔPWY. $\overline{WY} \parallel \overline{QR}$, $|\overline{QR}| = 15$ cm , $|\overline{WY}| = 6$ cm and $|\overline{WP}| = 4$ cm. Find $|\overline{WQ}|$.

A. 6 cm
B. 12 cm
C. 10 cm
D. 8 cm

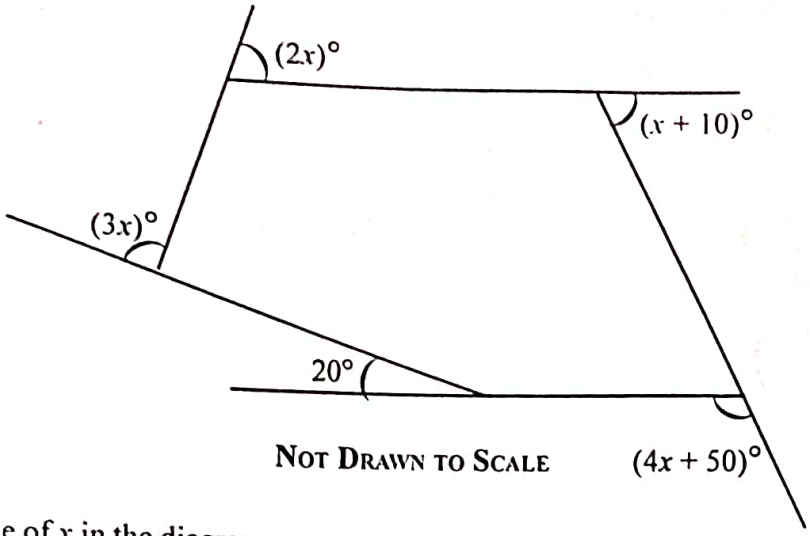
29. A cylindrical container closed at both ends has a radius of 3 cm and height 4 cm. What is the total surface area of the container? [Take $\pi = \frac{22}{7}$]

A. 103.7 cm^2
B. 132.0 cm^2
C. 125.7 cm^2
D. 113.1 cm^2

30. The diameter of a bicycle wheel is 21 cm. If the wheel makes 8 complete revolutions, what will be total distance covered by the wheel? [Take $\pi = \frac{22}{7}$]

A. 132 cm
B. 1, 386 cm
C. 1,056 cm
D. 528 cm

31.



NOT DRAWN TO SCALE

Find the value of x in the diagram.

A. 16
B. 44
C. 36
D. 28

32. The interior angles of a triangle are $(y + 10)°$, $(2y - 40)°$ and $(3y - 90)°$. Which of the following accurately describes the triangle?

A. isosceles triangle
B. right-angled triangle
C. equilateral triangle
D. scalene triangle

33. Given that $\sin A = \frac{3}{5}$, $0° \leq A \leq 90°$, find the value of $(\tan A - \cos A)$.

A. $-\frac{1}{20}$
B. $\frac{7}{20}$
C. $-\frac{3}{20}$
D. $\frac{1}{20}$

34. Simplify: $3 \log x + \log y - 2 \log z$.

A. $\log\left(x^3yz^{-2}\right)$

B. $\log\left(\frac{3xy}{2z}\right)$

C. $\log\left(\frac{3xy}{z^2}\right)$

D. $\log\left(\frac{x^3y}{z^2}\right)$

35. Simplify: $\frac{a^{-\frac{1}{4}} \times a^{\frac{1}{2}}}{a^{-\frac{1}{2}}}$.

A. $a^{\frac{3}{4}}$

B. $a^{-\frac{1}{4}}$

C. $a^{-\frac{1}{2}}$

D. $a^{\frac{1}{2}}$

36. The area of a square parcel of land is 256 m^2. A rectangular field of length 20 m has the same perimeter as the parcel of land. Find the area of the field.

A. 144 m^2

B. 400 m^2

C. 320 m^2

D. 240 m^2

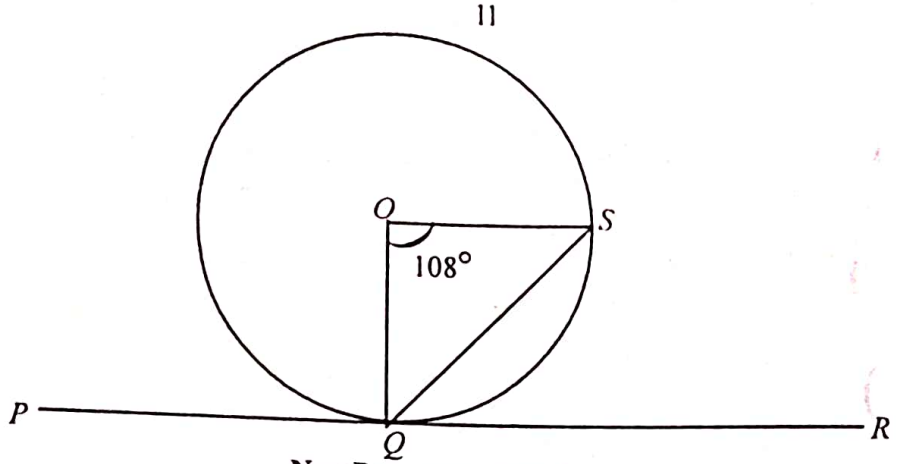
37. Mr. Abban invested \$1,200.00 for 3 years at 5 % per annum compound interest. Find the interest earned at the end of three years.

A. \$189.15

B. \$1,389.15

C. \$1,380.00

D. \$180.00



NOT DRAWN TO SCALE

In the diagram $\overline{PR}$ is tangent to the circle at Q. The centre of the circle is O and $\angle QOS = 108°$.
Use the information to answer questions **38** *and* **39**.

38. Find $\angle$ OSQ.

A. 72°
B. 18°
C. 36°
D. 42°

39. Find $\angle$ SQR.

A. 36°
B. 72°
C. 54°
D. 42°

40. Find the value of x that satisfies the equation: $\frac{2}{3}(x+5) = 1 - \frac{x-7}{2}$.

A. 1
B. 4
C. 3
D. 2

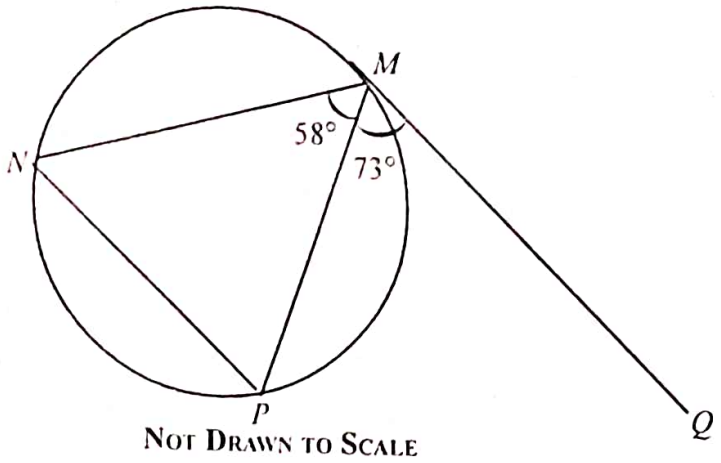
41. A closed cuboid has length 12 cm, width 7 cm and height 5 cm. Calculate the total surface area.

A. 179 cm^2
B. 420 cm^2
C. 358 cm^2
D. 210 cm^2

42. Mr. Amuzu sold his car through an agent who charged 9 % commission on the selling price. If Amuzu received GH¢ 236,600.00 after the sale, find the selling price of the car.

A. GH¢ 238,400.00
B. GH¢ 248,000.00
C. GH¢ 260,000.00
D. GH¢ 273,000.00

43.



NOT DRAWN TO SCALE

The diagram shows a triangle MNP inscribed in a circle. $\overline{MQ}$ is a tangent to the circle at M. Find $\angle MPN$.

A. 49°
B. 131°
C. 73°
D. 58°

In an examination taken by 120 students, 90 passed Mathematics, 40 passed Science and 5 failed both subjects. *Use the information to answer questions* **44** *and* **45**.

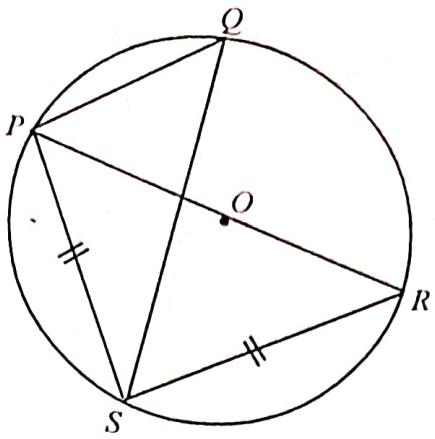
44. How many students passed Science **only**?

A. 15
B. 75
C. 25
D. 20

45. Find the probability that a student selected at random passed **only** one subject.

A. $\frac{1}{6}$
B. $\frac{19}{24}$
C. $\frac{5}{6}$
D. $\frac{7}{24}$

46.



NOT DRAWN TO SCALE

In the diagram, $\overline{PR}$ is a diameter of the circle $PQRS$ with centre O. Find the value of $\angle PQS$.

A. $37°$

B. $90°$

C. $55°$

D. $45°$

47. If $P(-7, 8)$ is reflected in the line $x - 2 = 0$, find the coordinates of the image of P.

A. $\begin{pmatrix} 5 \\ 8 \end{pmatrix}$

B. $\begin{pmatrix} 8 \\ -7 \end{pmatrix}$

C. $\begin{pmatrix} 11 \\ -8 \end{pmatrix}$

D. $\begin{pmatrix} 11 \\ 8 \end{pmatrix}$

48. Find the product of 124_{seven} and 23_{seven}.

A. 3125_{seven}

B. 3215_{seven}

C. 3211_{seven}

D. 3115_{seven}

49. Given that $m = 5$, $n = 3$ and $r = 2$, evaluate $\dfrac{(m^2 - n^2) + r^2}{m^2 + (n^2 - r^2)}$.

A. $\frac{1}{3}$

B. $\frac{4}{3}$

C. 1

D. $\frac{2}{3}$

50. Three boys of ages 2, 4, and 10 shared 32 oranges in the ratio of their ages. What was the **least** share?

A. 4

B. 10

C. 8

D. 6

END OF PAPER