1. If $\{x : 2 \leq x \leq 18; x \in \text{ integer }\}$ and $7 + x = 4 \pmod 9$, find the highest value of x.

   A. 2 B. 5 C. 15 D. 18

2. The sum of $11011_2 11111_2$ and 10000_2 is $10m10n0_2$. Find the values of m and n.

   A. $m = 0, n = 0$ B. $m = 1, n = 0$ C. $m = 0, n = 1$ D. $m = 1, n = 1$

3. A trader bought an engine for \$15,000.00 outside Nigeria. If the exchange rate is \$0.075 to ₦1.00, how much did the engine cost in naira?

   A. ₦250,000.00 B. ₦200,000.00 C. ₦150,000.00 D. ₦100,000.00

4. If $\dfrac{27^x \times 3^{1-x}}{9^{2x}} = 1$, find the value of x.

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

5. Find the 7^{th} term of the sequence: $2, 5, 10, 17, 26, \ldots$

   A. 37 B. 48 C. 50 D. 63

6. Given that $log_x 64 - 3$, evaluate $x \log_2 8$.

   A. 6 B. 9 C. 12 D. 24

7. If $2^n = y$, find $2^{\left(2+\frac{n}{3}\right)}$.

   A. $4y^{\frac{1}{3}}$ B. $4y^{-3}$ C. $2y^5$ D. $2y^{-3}$

8. Factorize completely: $6ax - 12by - 9ay + 8bx$.

   A. $(2a - 3b)(4x + 3y)$ B. $(3a + 4b)(2x - 3y)$

   C. $(3a - 4b)(2x + 3y)$ D. $(2a + 3b)(4x - 3y)$

9. Find the equation whose roots are $\dfrac{3}{4}$ and -4.

   A. $4x^2 - 13x + 12 = 0$ B. $4x^2 - 13x - 12 = 0$

   C. $4x^2 + 13x - 12 = 0$ D. $4x^2 + 13x + 12 = 0$

10. If $m = 4, n = 9$ and $r = 16$, evaluate $\dfrac{m}{m} - 1\dfrac{3}{4} + \dfrac{n}{r}$.

    A. $1\dfrac{3}{11}$ B. $1\dfrac{1}{16}$ C. $\dfrac{5}{16}$ D. $-\dfrac{37}{43}$

11. Adding 42 to a given positive number gives the same result as squaring the number. Find the number.

    A. 14 B. 13 C. 7 D. 6

12. Ada draws the graphs of $y = x^2 - x - 2$ and $y = 2x - 1$ on the same axes. Which of these equations is she solving?

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

13. The volume of a cone of height 3cm is $38\frac{1}{2}cm^3$. Find the radius of its base. [Take $\pi = \frac{22}{7}$]

A. 3.0cm B. 3.5cm C. 4.0cm D. 4.5cm

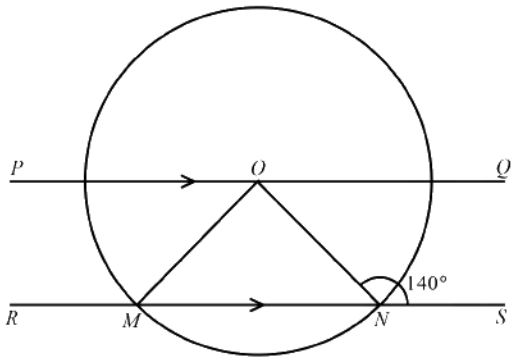
14. A sector of a circle with radius 6cm subtends an angle of 60° at the centre. Calculate its perimeter in terms of π

A. $2(\pi + 6)$ cm B. $2(\pi + 3)$ cm C. $2(\pi + 2)$ cm D. $(\pi + 12))$ cm

15. The dimensions of a rectangular tank are 2m by 7m by 11m. If its volume is equal to that of a cylindrical tank of height 4cm, calculate the base radius of the cylindrical tank. [Take $\pi = \frac{22}{7}$]

A. 14m B. 7m C. $3\frac{1}{2}m$ D. $1\frac{3}{4}m$

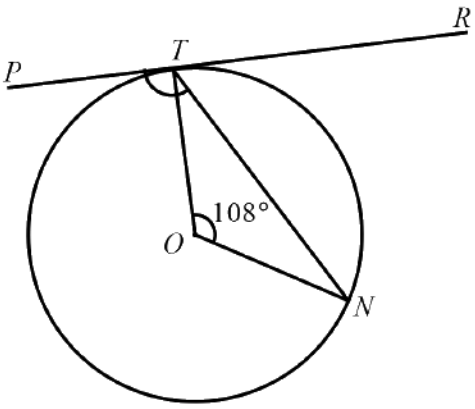
16.



In the diagram, O is the centre of the circle. If $PQ//RS$ and $\angle ONS = 140^\circ$ Find the size of $\angle POM$

A. 40° B. 50° C. 60° D. 80°

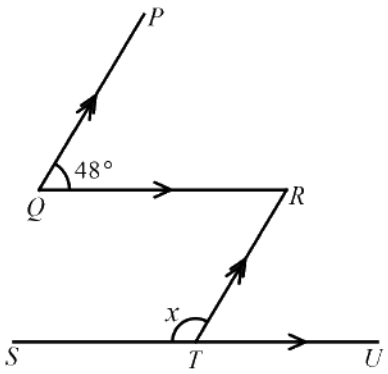
17.



In the diagram, PTR is a tangent to the circle centre O. If angle $TON = 108^\circ$ calculate the size of angle PTN

A. 132° B. 126° C. 108° D. 102°

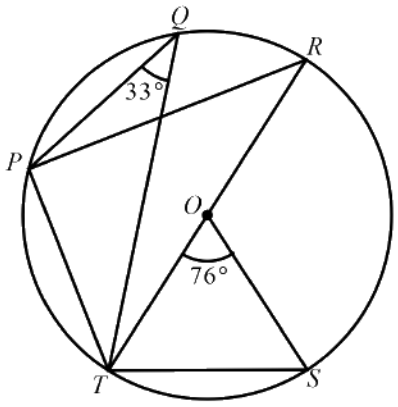
18.



In the diagram, $PQ \parallel RT, QR \parallel SU$,$\angle PQR = 48^\circ$ and $\angle RTS = x$. Find the value of x.

A. 134° B. 132° C. 96° D. 48°

In the diagram, O is the centre of the circle, $\overline{RT}$ is a diameter, $\angle PQT = 33^\circ$ and $\angle TOS = 76^\circ$ *Use this diagram to answer questions* ***19*** *and* ***20***.



19. Calculate the value of angle PTR

A. 73° B. 67° C. 57° D. 37°

20. Find the size of angle PRS.

A. 76° B. 71° C. 38° D. 33°

The table shows some values for a linear graph. *Use it to answer questions* ***21*** *and* ***22***

x	0	$1\frac{1}{4}$	2	4
y	3	$5\frac{1}{2}$		

21. Find the gradient of the line.

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

22. What is the value of y when $x = 2$?

A. 5 B. 7 C. 9 D. 11

23. Given that $\tan x = \frac{2}{3}$, where $0^\circ \leq x \leq 90^\circ$ find the value of $2\sin x$

A. $\frac{2\sqrt{13}}{13}$ B. $\frac{3\sqrt{13}}{13}$ C. $\frac{4\sqrt{13}}{13}$ D. $\frac{6\sqrt{13}}{13}$

24. $PQRS$ is a square. If X is the midpoint of PQ, calculate, correct to the nearest degree, $\angle PXS$.

A. 53° B. 55° C. 63° D. 65°

25. The angle of elevation of an aircraft from a point K on the horizontal ground is 30° If the aircraft is 800m above the ground, how far is it from K?

A. 400.00m B. 692.82m C. 923.76m D. 1,600.00m

26. The population of students in a school is 810. If this is represented on a pie chart, calculate the sectoral angle for a class of 72 students.

A. 32° B. 45° C. 60° D. 75°

27. The scores of twenty students in a test are as follows: 44,47,48,49,50,51,52,53,53,54,58,59,60,61,63,65,67,7
Find the third quartile.

A. 62 B. 63 C. 64 D. 65

28. The table shows the distribution of the scores of some students in a test.

Scores	$0-4$	$5-9$	$10-14$
Frequency	2	1	2

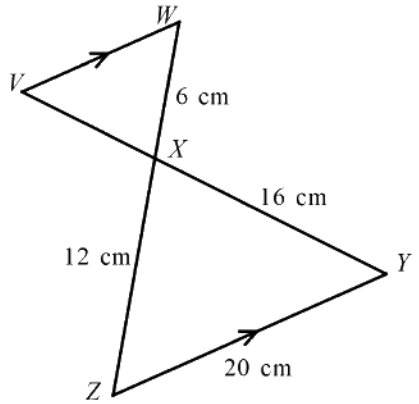
Calculate the mean score.

A. 5.6 B. 6.2 C. 6.6 D. 7.0

29. The probabilities that Kebba, Ebou and Omar will hit a target are $\frac{2}{3}, \frac{3}{4}$ and $\frac{4}{5}$ respectively. Find the probability that only Kebba will hit the target.

A. $\frac{2}{5}$ B. $\frac{7}{60}$ C. $\frac{1}{30}$ D. $\frac{1}{60}$

30. In the diagram, $VW \parallel YZ, |WX| = 6\text{cm}, |XY| = 16\text{cm}, |YZ| = 20\text{cm}$ and $|ZX| = 12\text{cm}$. Calculate $|VX|$.



A. 3cm B. 4cm C. 6cm D. 8cm

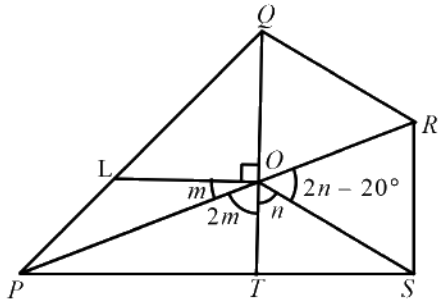
31. Tom will be 25 years old in n years' time. If he is 5 years younger than Bade, find Bade's present age.

A. $(30-n)$ years B. $(20-n)$ years C. $(25-n)$ years D. $(30+n)$ years

32. If $\frac{\sqrt{2}+\sqrt{3}}{\sqrt{3}}$ is simplified as $m+n\sqrt{6}$ find the value of $(m+n)$.

A. $\frac{1}{3}$ B. $\frac{2}{3}$ C. $1\frac{1}{3}$ D. $1\frac{2}{3}$

33.



In the diagram, $\overline{QT}$ and $\overline{PR}$ are straight lines. $\angle ROS = (3n - 20^\circ), \angle POT = 2m$, $\angle SOT = n. \angle POL = m$ and $\angle QOL$ is a right angle. Find the value of n.

A. 35° B. 40° C. 55° D. 60°

34. Make k the subject of the relation $T = \sqrt{\frac{\pi - H}{k - H}}$

A. $k = \frac{H(T^2 - 1)}{T^2 - T}$ B. $k = \frac{HT}{(T-1)^2}$ C. $k = \frac{H(T^2 + 1)}{T}$ D. $k = \frac{H(T-1)}{T}$

35. Which of the following is used to determine the mode of a grouped data?

A. Bar Chart B. Frequency Polygon

C. Ogive D. Histogram

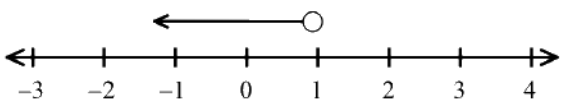
36. The area of a rhombus is 110cm^2. If the diagonals are 20cm and $(2x + 1)$cm long, find the value of x.

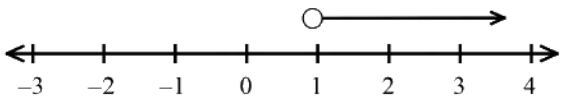
A. 5.0 B. 4.0 C. 3.0 D. 2.5

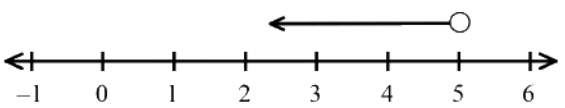
37. Simplify : $\frac{3x - y}{xy} - \frac{2x + 3y}{2xy} + \frac{1}{2}$.

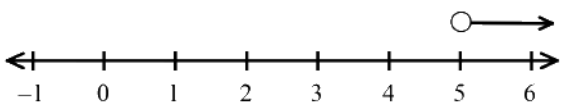
A. $\frac{4x + 5y - xy}{2xy}$ B. $\frac{5y - 4x + xy}{2xy}$ C. $\frac{5x + 4y - xy}{2xy}$ D. $\frac{4x - 5y + xy}{2xy}$

38. Illustrate graphically, the solution of $\frac{y}{2} + \frac{1}{8} > \frac{5y}{8}$.

A.


B.


C.


D.


39. A farmer use $\frac{2}{5}$ of his land to grow cassava, $\frac{1}{3}$ of the remainder for yams and the rest for maize. Find the part of the land used for maize.

A. $\frac{2}{15}$ B. $\frac{2}{5}$ C. $\frac{2}{3}$ D. $\frac{4}{5}$

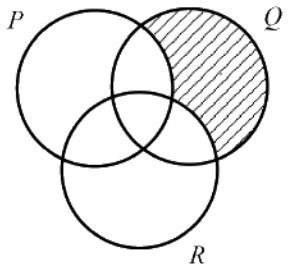
40. The rate of consumption of petrol by a vehicle varies directly as the square of the distance covered. If 4 litres of petrol is consumed on a distance of 15km, how far would the vehicle go on 9 litres of petrol?

A. $22\frac{1}{2}$km B. 30km C. $33\frac{3}{4}$km D. 45km

41. A trader bought 100 oranges at 5 for N 40.00 and sold them at 20 for N120.00 Find the profit of loss per cent.

A. 20% profit B. 20% loss C. 25% profit D. 25% loss

42.



Describe the shaded portion in the diagram.

A. $P' \cap Q \cap R'$ B. $(P \cap R)' \cap Q$ C. $P' \cap Q \cap R$ D. $(P \cup Q)' \cap R$

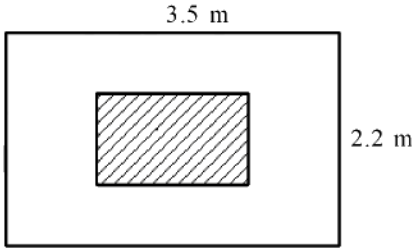
43. Find the value of p if $\frac{1}{4}p + 3q = 10$ and $2p - \frac{1}{3}q = 7$.

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

44. Calculate the mean deviation of 5,3,0,7,2,1.

A. 0.0 B. 2.0 C. 2.5 D. 3.0

45. In the diagram, the shaded part is a carpet laid in a room with dimensions 3.5m by 2.2m leaving a margin of 0.5m round it. Find the area of the margin.



A. 4.7m^2 B. 4.9m^2 C. 5.7m^2 D. 5.9m^2

46. Two angles of a pentagon are in the ratio 2 : 3. The others are 60° each. Calculate the smaller of the two angles.

A. 72° B. 100° C. 120° D. 144°

47. A letter is selected from the letters of the English alphabet. What is the probability that the letter selected is from the word MATHEMATICS?

A. $\frac{9}{13}$ B. $\frac{11}{26}$ C. $\frac{4}{13}$ D. $\frac{1}{26}$

48. In a circle of radius $r$cm, a chord $16\sqrt{3}$cm long is 10cm from the centre of the circle. Find, correct to the nearest cm the value of r.

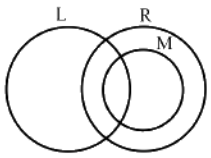
A. 22cm B. 17cm C. 16cm D. 15cm

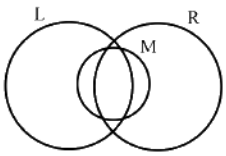
49. Consider the following statements:

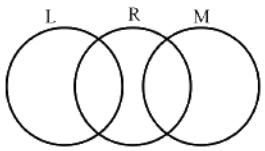
X : Locally manufactured tyres are attractive.

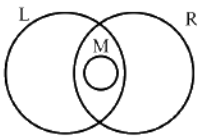
Y : Many locally manufactured tyres do not last long.

Denoting locally manufactured tyres by M, attractive tyres by R and long lasting tyres by L, which of these Venn diagrams illustrates the statements?

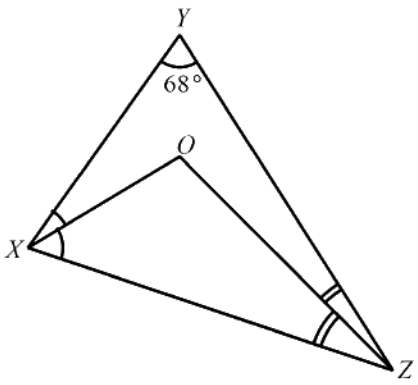
A. 

B. 

C. 

D. 

50. In the diagram, $\overline{OX}$ bisects $\angle YXZ$ and $\overline{OZ}$ bisects $\angle YZX$. If $\angle XYZ = 68^\circ$. Calculate the value of $\angle XOZ$.



A. 68° B. 72° C. 112° D. 124°