

2018 WASSCE MATHEMATICS THEORY

1.

A used car was purchased at \$900,000.00. Its value depreciated by 30% in the first year. In each subsequent year, the depreciation was 22% of its value at the beginning of that year. If the car was bought on 1st March, 2011, calculate correct to the **nearest hundred dollar**, the value of the car on 28th February, 2015.

2.

(a) The graph of $y = 2px^2 - p^2x - 14$ passes through the point (3, 10). Find the value of p.

(b) Two lines, $3y - 2x = 21$ and $4y + 5x = 5$ intersect at the point Q. Find the coordinate of Q.

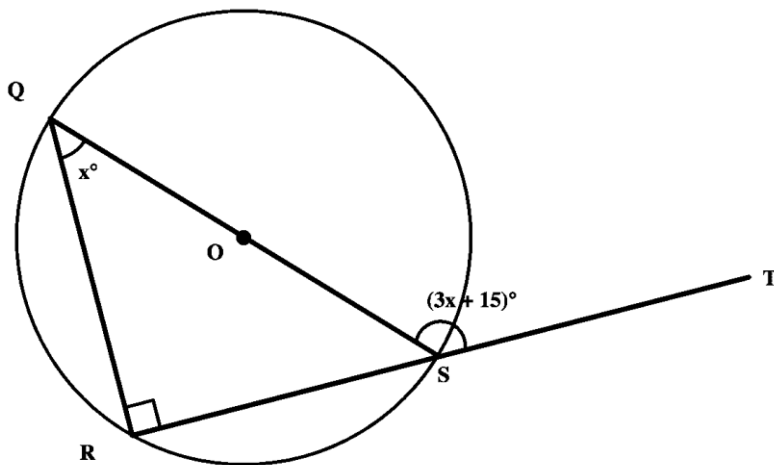
3.

(a) The diagonals of a rhombus are 10.2cm and 9.3cm long. Calculate, correct to one decimal place, the perimeter of the rhombus

(b) Given that $\sin x = \frac{3}{5}$, $0^\circ < x^\circ < 90^\circ$

Find the value of $5 \cos x - 4 \tan x$

4.



In the diagram $\angle QOS$ is a diameter, $\angle RQS = x^\circ$ and $\angle QST = (3x + 15)^\circ$ Find:

(i) The value of x

(ii) $\angle RSQ$

(b) If $2N_{\text{Seven}} = 15N_{\text{Nine}}$, find the value of N.

5.

(a) If the mean of m , n , s , p and q is 12, calculate the mean of $(m + 4)$, $(n - 3)$, $(s + 6)$, $(p - 2)$ and $(q + 8)$.

(b) In a community of 500 people the 75th percentile age is 65 years while the 25th percentile age is 15 years. How many of the people are between 15 and 65 years?

6.

In a roadworthiness test on 240 cars, 60% passed. The number that failed had faults in Clutch, Brakes, and Steering as follows: Clutch only – 28; Clutch and Steering – 14; Clutch, Steering and brakes – 8; Clutch and Brakes – 20; Brakes and Steering only – 6. The number of cars with faults in Steering only is twice the number of cars with faults in Brakes only.

(a) Draw a Venn diagram to illustrate this information

(b) How many cars had;

(i) Faulty Brakes

(ii) Only one faulty?

7.

(a) Find the equation of the line passing through the points $(2, 5)$ and $(-4, -7)$.

(b) Three ships P, Q, and R are at sea. The bearing of Q from P is 030° and the bearing of P from R is 300° . If $|PQ| = 5\text{km}$ and $|PR| = 8\text{km}$,

(i) Illustrate the information in a diagram

(ii) Calculate, correct to three significant figures, the:

- distance between Q and R;
- bearing of R from Q

8.

(a) Lamin bought a book for N300.00 and sold it to Bola at a profit of $x\%$. Bola then sold the same book to James

at a profit of $x\%$. If James paid $N \left(6x + \frac{3}{4} \right)$ more for the book than what Lamin paid, find the value of x .

(b). Find the range of values of x which satisfies the inequality

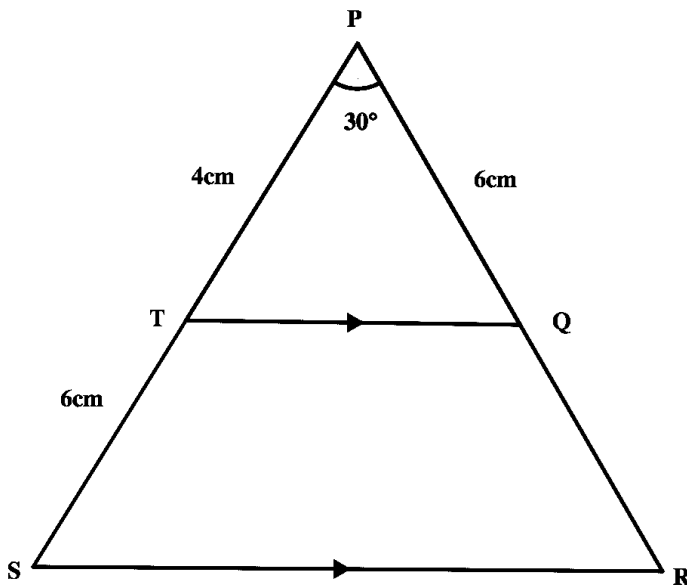
$$3x - 2 < 10 + x < 2 + 5x$$

9.

In the diagram, $|PT| = 4\text{cm}$, $|TS| = 6\text{cm}$, $|PQ| = 6\text{cm}$ and $\angle SPR = 30^\circ$. Calculate, correct to the **nearest** whole number.

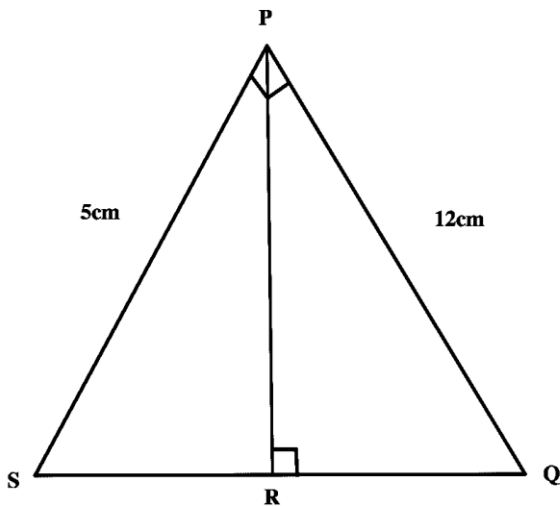
(a) $|SR|$

(b) area of TQRS.



10.

(a) In $\triangle PQS$, $|PQ| = 12\text{cm}$, $|PS| = 5\text{cm}$, $\angle SPQ = \angle PQR = 90^\circ$, Find, correct to the three significant figures, $|PR|$.



(b) The lengths of two ladders, L and M are 10m and 12m respectively. They are placed against a wall such that each ladder makes the same angle with the horizontal ground. If the foot of L is 8m from the foot of the wall.

(i) Draw a diagram to illustrate this information

(ii) Calculate the height at which M touches the wall

11.

(a) Copy and complete the table of values for

$$y = 2x^2 + x - 10 \text{ for } -5 \leq x \leq 4$$

x	-5	-4	-3	-2	-1	0	1	2	3	4
y			5		-9	-10		0		

(b) Using scales of 2cm to 1 unit on the x-axis and 2cm to 5 units on the y-axis draw the graph of $y = 2x^2 + x - 10$ for $-5 \leq x \leq 4$

(c) Use the graph to find the solution of:

(i) $2x^2 + x = 10$

(ii) $2x^2 + x - 10 = 2x$

12.

(a)

If

$$x = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$$

$$y = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$$

$$z = \begin{pmatrix} -4 \\ 13 \end{pmatrix}$$

Find Scalars p and q Such that $px + qy = z$

(b) (i) Using a scale of 2cm to 2 units on both axis, draw on a graph paper two perpendicular axis Ox and Oy for $-5 \leq x \leq 5$, $-5 \leq y \leq 5$ respectively

(ii) Draw on the graph paper, indicating clearly the vertices and their coordinates

(1) The quadrilateral WXYZ with $W(2,3)$, $X(4, -1)$, $Y(-3, -4)$ and $Z(-3, 2)$

(2) The image $W_1X_1Y_1Z_1$ of quadrilateral WXYZ under an anti-clockwise rotation of 90° about the origin. Where $W \rightarrow W_1$, $X \rightarrow X_1$, $Y \rightarrow Y_1$ and $Z \rightarrow Z_1$

13.

Marks	10	20	30	40	50	60	70	80	90
Frequency	1	1	x	5	y	1	4	3	1

2. The frequency table shows the marks distribution of a class of 30 students in an examination. The mean mark of the distribution is 52.
3. (a) Find the values of x and y
4. (b) Construct a group frequency distribution table starting with a lower class limit of 1 and a class interval of 10.
5. (c) Draw a histogram for the distribution
6. (d) Use the histogram to estimate the mode.