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SECTION A

1. Make q the subject $m - pq = \frac{qv^2}{r}$.

2. Form a quadratic equation in x whose roots are – ¾ and $^4/_5$

3. Given that √3 = 1.7321 and √7 = 2.6458, evaluate √75 +√28.

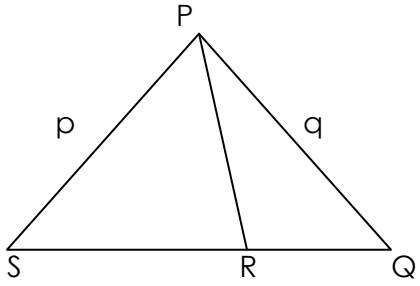
4. A car is listed by the manufacturer at £3500. Garage answer buys it from the manufacturer for £2380. What is the trade discount percent?

5. Solve the simultaneous equations by substitution method.
$x - y = 3$

$\frac{x}{5} - \frac{y}{7} = \frac{27}{35}$

6. Given A(-3, 4) and B(5, 10), find $|AB|$.

7. In the figure below SR = ¾ SQ, DP = p and PQ = q, find PR in terms of p and q.



8. If $f(x) = 2x + 8$, find

(i) $f(-4)$ (ii) the values of x if $f(x) = 10..$

9. A basket contains 5 ripe and 7 unripe mangoes. Paul picked 5 mangoes in succession. Find the probability that he got 2 unripe and 1 ripe mango in that order, if he picked the mangoes:

(i) With replacement.
(ii) Without replacement.

10. Find the value of x to three significant figures (3sf),
$\log x^2 = \log\sqrt{16} - \log 2 + \log 3^2$.

SECTION B

11. The points A(4, 1), B(0, -2) and C(-2, 4) were transformed by

$$M = \begin{pmatrix} 2 & -1 \\ 1 & 2 \end{pmatrix}$$

(a) Write down the coordinates of A^1, B^1 and C^1.

(b) The points A^1, B^1 and C^1 were further transformed by $N = \begin{pmatrix} -1 & 1 \\ 2 & -3 \end{pmatrix}$.

B^{11} and C^{11}. Find a single matrix that would map A^{11}, B^{11} and C^{11} back to A, B and C.

(c) If the area of ΔABC is 30 square units find the ratio of
ΔABC: $\Delta A^{11}B^{11}C^{11}$

12. In Nsambya hospital, Doctors are subjected to taxation after deducting the allowances below:

Single	50,000/= per month
Married	30,000/= per month
Dependant child each at	384,000/= per year
Medical upkeep	60,000/= per month
Electricity	204,000/= per annum
Water	3,000/= per day
Housing	100,000/= per month

A child in the age bracket of 12 to 18 years 22,500/= each. The table below prescribed the tax structure for the hospital.

Monthly taxable income	**Rate %**
0 – 50,000	Free
50,001 – 155,000	5.5
155,001 - 395,000	8.2
395,001 – 465,200	12.5
465,001 – and above	15.0

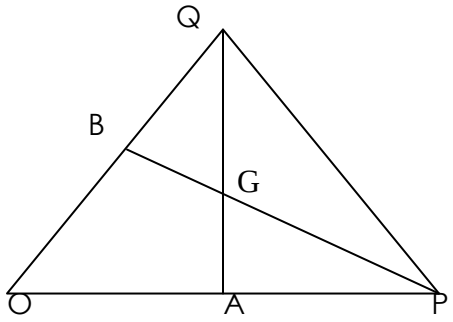
Doctor Okurut earns a monthly salary of Sh. 1,037,500/=, he is single with four dependants.

(a) Calculate doctor Okurutu's

(i) Allowances
(ii) Taxable income
(iii) Income tax.

(b) Calculate his income tax as a percentage of his taxable income.

13.



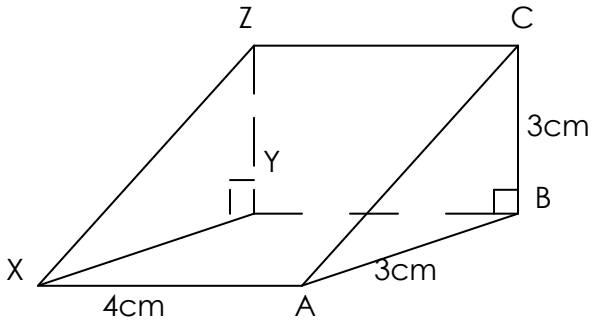
In the diagram OPQ is a triangle, such that OA = 3a, OB = 3b and OP = 20A, OQ = 2OB.

(i) Find in terms of a and b, the vectors AB PQ and OG.
(ii) Find the ratio in which Q divides BP and AQ.

14. The line TP is the tangent at P to the circle PQR and TQR is the secant such that QR is a diameter. If TP = 60mm and TQ = 20mm, calculate:

(a) The radius of the circle.
(b) The angle PTQ.
(c) The area of triangle PTR.

15.



In the figure above AB = BC = 3cm and XA = 4cm.
Calculate:

(i) The lengths XB and XC.
(ii) The angle between XC and the base plane.

(iii) The angle between planes ZCAX and ABYX.

16. A sector arc-length 11cm and radius of 3cm is used to make the curved surface of a cone. Calculate:

(i) The base-radius of the cone.

(ii) The vertical height.

(iii) The area of the curved surface.

(iv) The capacity of the cone.

E N D