MID TERM III EXAMINATIONS

S.3 MATHEMATICS

Paper 1

TIME: 2 hours

INSTRUCTIONS

Answer all the questions in both sections

1. Use factors to evaluate 617x793+786x793+597x793
2. Given that $\log_p$=2.476 and logq=1.811,find $\log\left(\frac{p}{q2}\right)$
3. Solve for p in the equation $\frac{4p-1}{3} - \frac{3p-1}{2} = \frac{5-2p}{4}$
4. Given the matrix A=$\begin{pmatrix}2 & 3\\5 & 7\end{pmatrix}$, find a matrix B such that A+ B =$\begin{pmatrix}1 & 0\\0 & 1\end{pmatrix}$
5. If a*b = $\frac{a}{b} + \frac{b}{a}$, evaluate $\frac{1}{2} * \frac{2}{3}$
6. Given that OP=$\binom{5}{3}$ and $OQ = \binom{-2}{5}$, find the magnitude of QP
7. If vectors a=$\binom{3}{-2}$, $b = \binom{1.5}{3}$, find the value of $\frac{1}{2}$a +3b
8. Without using tables or calculators,evaluate
9. Solve the equation $3x^2$ -7x + 2 =0

10. If u=$\binom{-2}{4}$, $v = \binom{1}{-3}$ and $w = \binom{-3}{4}$,find the value of a and b such that a(u) + b(v)=w

SECTION B

11. The table below shows ages of 120 students entering senior one

Age years	12.5-12.9	13.0-13.4	13.5-13.9	14.0-14.4	14.5-14.9
Number of students	8	35	52	17	8

a) state the i) class width

ii) modal class

b) determine the mean and median age of the students

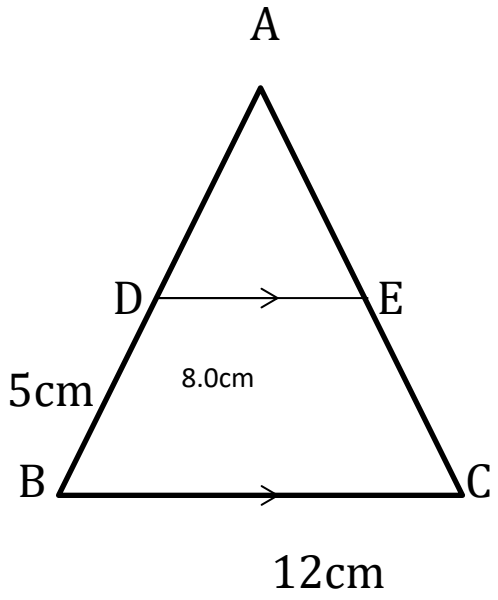
12. Draw the graph of the curve x^2 -2x +1 for -3≤ +≤ 3. Use the graph to find solutions of the following equations

i. x^2 -2x +1=0
ii. x^2 –x -6=0

13. a) Given that f(x)= $\frac{x+3}{2}$, g(x)= $\frac{1-2x}{5}$ determine the value of x for which fg(x) + gf(x)=0

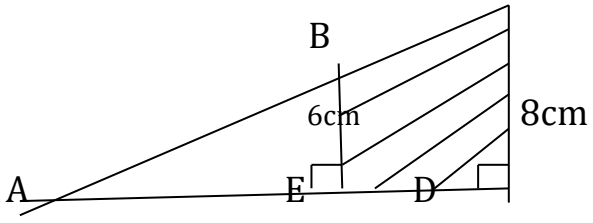
b) Express x^2 –x- $\frac{3}{4}$ in the form $(x+p)^2$ + q. Hence solve the equation x^2 –x- $\frac{3}{4}$ =0

14. in the figure below, $\overline{DE}$ =8cm, $\overline{BC}$ =12cm and $\overline{BD}$ =5.0cm



Given that $\overline{DE}$ is parallel to $\overline{BC}$,find length $\overline{AD}$

b) study the diagram below C



If AD=12cm, find the area of the shaded region

15. The lines ax+2y=3 and ax + by=5 intersect at (1,2), find a and b

b) if $\begin{pmatrix} 4 & 1 \\ x & -1 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 4 \\ 8 \end{pmatrix}$, determine the values of x and y

16. The venn diagram below shows the members of a district council who sit on three different committees of work(W), Production(P) and finance(F)

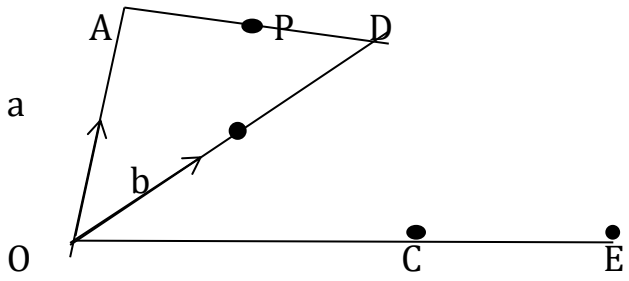
a) determine the values of x,y and z

b) Find the total number of members who

i. make upnthe district council
ii. belong to more than one committee

c) Given that a member is selected at random from the District council,find the probability that the number belongs to only two committees.

17. In the figure below,OA=a and OB=b, 3OB=2BD. P is a point on $\overline{AD}$



a) Express the following vectors in terms of a and b

i) AD ii) AP

b) show that $\overline{AD}$:$\overline{OE}$ =3:8

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