

1. Find the sum of ~~the~~ of the following column vectors and illustrate solutions graphically.

$$\vec{a} = \begin{pmatrix} 2 \\ 3 \end{pmatrix} \quad \text{and} \quad \vec{b} = \begin{pmatrix} 7 \\ 1 \end{pmatrix}$$

(5mks)

i) $3\vec{a} - \vec{b}$

ii) $\vec{a} + \vec{b}$

2. If vector $\vec{a} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$ and $\vec{b} = \begin{pmatrix} 2 \\ 2 \end{pmatrix}$

Find $2\vec{a} + 3\vec{b}$

(3mks)

3. Find scalars λ and μ are such

(4mks)

$$\lambda \begin{pmatrix} 4 \\ 3 \end{pmatrix} + \mu \begin{pmatrix} -2 \\ 1 \end{pmatrix} = \begin{pmatrix} 0 \\ -3 \end{pmatrix}$$

4. Find the co-ordinates of the mid points of AB in the following.

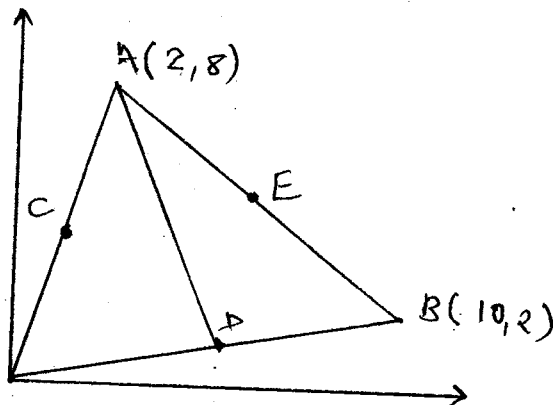
i) $A(-3, 2)$ $B(4, 2)$

(2mks)

ii) $A(0, 4)$ $B(0, -2)$

(2mks)

5. In the figure below O A B is a triangle. A is the points $(2, 8)$ and B is a point $(10, 2)$. C, D and E are mid points of O A, O B and AB respectively



a) Find the co-ordinates of C and D.

(3mks)

b) Find the lengths of vector AB and CD.

(3mks)

6. At a Police Check point the speeds of the first 50 vehicles were recorded as follows:-

Speed	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69
No of Vehicles	3	1	2	5	6	11

Speed	70 – 79	80 – 89	90 – 99	100 – 109
No. of Vehicles	9	8	3	2

a) Calculate the mean speed.

(3mks)

b) Estimate the median speed.

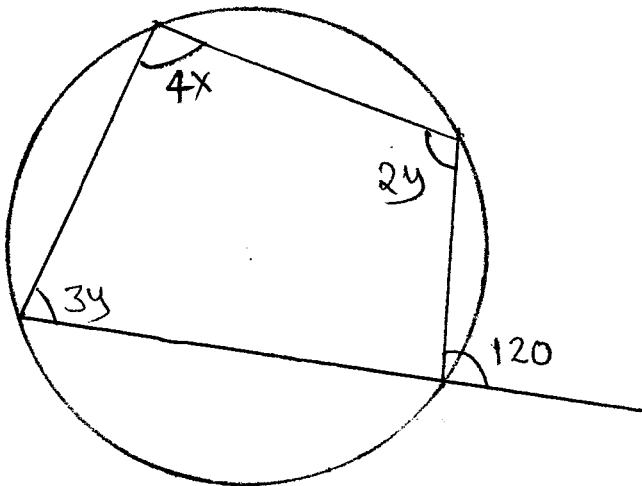
(3mks)

c) Draw a histogram to represent the information.

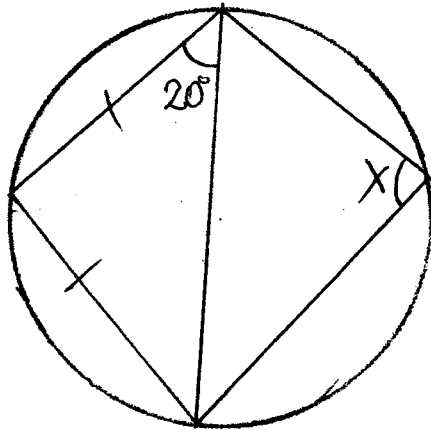
(4mks)

7. Find the values of X and y in the following.

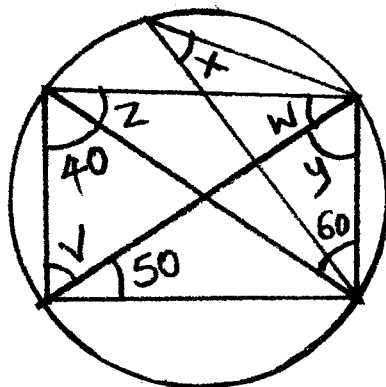
a) (3mks)



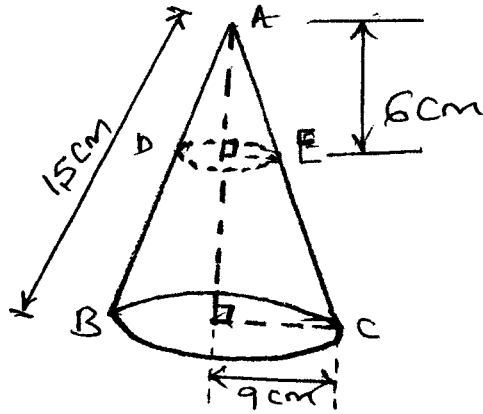
b) (2mks)



8. Calculate the angles marked V, W, X, Y and Z (5mks)



11. The figure below shows a cone with vertex at A and diameter BC. The cone is cut off along DE



a) Find the base radius of the smaller cone.

(5mk

b) Find the volume of the frustum

(5mks

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