

- (17) any point on x axis  $Q(x, 0)$   
any point on y axis  $P(0, y)$

$$A(2, -5)$$

$$P(0, y) \quad Q(x, 0)$$

A is midpoint of PQ

$$2 = \frac{0+x}{2}$$

$$\Rightarrow x = 4$$

$$-5 = \frac{y+0}{2}$$

$$\Rightarrow y = -10$$

$$\therefore P(0, -10), Q(4, 0) \quad (D)$$

(18)  $\text{ar}(\Delta) = \frac{1}{2} \begin{vmatrix} a & b+c \\ b & c+a \\ c & a+b \\ a & b+c \end{vmatrix}$

$$= \frac{1}{2} |ac + a^2 - b^2 - bc + ab + b^2 - c^2 - ac + bc + c^2 - a^2 - ab|$$

$$= \frac{1}{2} |0|$$

$$= 0$$

(19)  $AB = 5$   
 $\Rightarrow AB^2 = 5^2$   
 $(1-4)^2 + (0-p)^2 = 25$   
 $9 + p^2 = 25$   
 $\Rightarrow p^2 = 25 - 9$   
 $\Rightarrow p = \pm \sqrt{16}$   
 $= \pm 4 \quad (B)$

(20) Points  $A(1, 2)$ ,  $O(0, 0)$   
and  $C(a, b)$  are  
collinear

$$\therefore \text{ar}(\Delta AOB) = 0$$

$$\frac{1}{2} [1(0-b) + 0(b-2) + a(2-0)] = 0$$

$$\Rightarrow -b + 2a = 0$$

$$\Rightarrow 2a = b \quad (C)$$