Exercise 16A

Question 6:

Let A(a, 2), B(8, -2) and C(2,-2) be the given points. Then first we find:

$$AB = \sqrt{(8-a)^2 + (-2-2)^2} = \sqrt{64 + a^2 - 16a + 16}$$
$$= \sqrt{a^2 - 16a + 80}$$

And

$$AC = \sqrt{(2-a)^2 + (-2-2)^2} = \sqrt{4 + a^2 - 4a + 16} = \sqrt{a^2 - 4a + 20}$$
$$\sqrt{a^2 - 16a + 80} = \sqrt{a^2 - 4a + 20}$$
$$(\text{on squaring both side, we get})$$
$$a^2 - 16a + 80 = a^2 - 4a + 20$$
$$-12a = -60 \Rightarrow a = \frac{-60}{-12} = 5$$

Therefore, a = 5

Question 7:

Let any point P on x - axis is (x,0) which is equidistant from A(-2, 5) and B(-2, 9).

$$\Rightarrow PA = PB \quad \text{or} \quad PA^2 = PB^2$$
$$\Rightarrow (x+2)^2 + (0-5)^2 = (x+2)^2 + (0-9)^2$$
$$\Rightarrow x^2 + 4x + 4 + 25 = x^2 + 4x + 4 + 81 \Rightarrow 29 = 85$$

This is not admissible.

Hence, there is no point on x - axis which is equidistant from A(-2, 5) and B(-2, 9).

Question 8:

Let any point P on x - axis is (0,y) which is equidistant from A(5, -2) and B(-3, 2)

$$\Rightarrow PA = PB \quad \text{or} \quad PA^2 = PB^2$$
$$\therefore (0-5)^2 + (y+2)^2 = (0+3)^2 + (y-2)^2$$
$$25 + y^2 + 4y + 4 = 9 + y^2 - 4y + 4$$
$$\text{or} \quad 25 + 4y = 9 - 4y$$
$$\Rightarrow 8y = 9 - 25 = -16 \quad \therefore y = -2$$

Thus, the point on y - axis is (0, -2).

*********** END **********