Exercise 9.1

Q1. Find the distance between the following pairs of points

a) $A(9, 2), B(7,2)$

Sol. $|AB| = \sqrt{(x_2 - x_1)^2 + (y_2 + y_1)^2}$

$= \sqrt{(7-9)^2 + (2-2)^2}$

$= \sqrt{(-2)^2 + (0)^2}$

$= \sqrt{4}$

$= 2$

b) $A(2,-6), B(3,-6)$

Sol. $|AB| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(3-2)^2 + (-6+6)^2}$

$= \sqrt{(1)^2 + (0)^2}$

$= \sqrt{1}$

$= 1$

c) $A(-8, 1), B(6, 1)$

Sol. $|AB| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(6+8)^2 + (1-1)^2}$

$= \sqrt{(14)^2 + (0)^2}$

$|AB| = 14$

d) $A(-4, \sqrt{2}), B(-4, -3)$

Sol. $|AB| = \sqrt{(x_2 - x_1)^2 + (y_2 - y)^2}$

$= \sqrt{(-4+4)^2 + (-3-\sqrt{2})^2}$

$= \sqrt{(0)^2 + (-3-\sqrt{2})^2}$

$= \sqrt{(-3-\sqrt{2})^2}$

$= (3+\sqrt{2})^2$

$= 3+\sqrt{2}$

(e) $A(3,-11), B(3,-4)$

Sol. $|AB| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(3-3)^2 + (-4-(-11))^2}$

$= \sqrt{(0)^2 + (7)^2} = \sqrt{(7)^2} = 7$

(f) $A(0,0) \quad B(0,-5)$

$|AB| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Sol. $= \sqrt{(0-0)^2 + (-5-0)^2}$

$= \sqrt{0 + (-5)^2} = \sqrt{(5)^2} = 5$

Q2. Let P be the point on x-axis with x-coordinate a and Q be the point on y-axis with y-coordinate b, as given below. Find distance between P and Q.

i) $a = 9$, $b = 7$

$$|PQ| = \sqrt{(9)^2 + (7)^2} = \sqrt{81+49} = \sqrt{130}$$

ii) $a = 2$, $b = 3$

$$|PQ| = \sqrt{(2)^2 + (3)^2} = \sqrt{4+9} = \sqrt{13}$$

iii) $a = -8$, $b = 6$

$$|PQ| = \sqrt{(-8)^2 + (6)^2} = \sqrt{64+36} = \sqrt{100} = 10$$

iv) $a = -2$, $b = -3$

$$|PQ| = \sqrt{(-2)^2 + (-3)^2} = \sqrt{4+9} = \sqrt{13}$$

v) $a = \sqrt{2}$, $b = 1$

$$|PQ| = \sqrt{(\sqrt{2})^2 + (1)^2} = \sqrt{2+1} = \sqrt{3}$$

vi) $a = -9$, $b = -4$

$$|PQ| = \sqrt{(-9)^2 + (-4)^2} = \sqrt{81+16} = \sqrt{97}$$