

1(i) $A(2,3), B(4,1)$

$$\begin{aligned} AB &= \sqrt{(4-2)^2 + (1-3)^2} \\ &= \sqrt{2^2 + (-2)^2} \\ &= \sqrt{4+4} \\ &= \sqrt{8} \\ &= \sqrt{2 \times 2 \times 2} \\ &= 2\sqrt{2} \end{aligned}$$

1(ii) $A(-5,7), B(-1,3)$

$$\begin{aligned} AB &= \sqrt{(-1+5)^2 + (3-7)^2} \\ &= \sqrt{4^2 + (-4)^2} \\ &= \sqrt{16+16} \\ &= \sqrt{32} \\ &= \sqrt{2 \times 2 \times 2 \times 2 \times 2} \\ &= 2 \times 2 \sqrt{2} \\ &= 4\sqrt{2} \end{aligned}$$

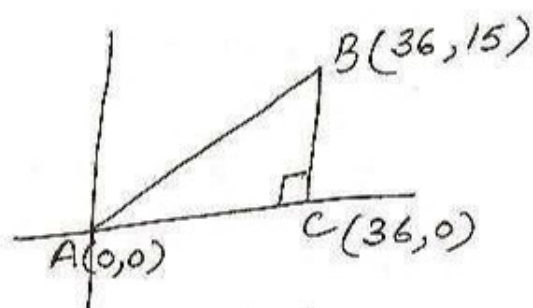
1(iii) $A(a,b), B(-a,-b)$

$$\begin{aligned} AB &= \sqrt{(-a-a)^2 + (-b-b)^2} \\ &= \sqrt{(-2a)^2 + (-2b)^2} \\ &= \sqrt{4a^2 + 4b^2} \\ &= \sqrt{4(a^2 + b^2)} \\ &= \sqrt{2 \times 2(a^2 + b^2)} \\ &= 2\sqrt{a^2 + b^2} \end{aligned}$$

2. $A(0,0), B(36,15)$

$$\begin{aligned} AB &= \sqrt{(36-0)^2 + (15-0)^2} \\ &= \sqrt{36^2 + 15^2} \\ &= \sqrt{1296 + 225} \\ &= \sqrt{1521} \\ &= 39 \end{aligned}$$

(ii)



distance between cities A and B

$$\begin{aligned} AB &= \sqrt{(36-0)^2 + (15-0)^2} \\ &= \sqrt{1521} \\ &= 39 \text{ km} \end{aligned}$$

3. $A(1,5), B(2,3), C(-2,-11)$

$$\begin{aligned} AB &= \sqrt{(2-1)^2 + (3-5)^2} \\ &= \sqrt{1^2 + (-2)^2} \\ &= \sqrt{1+4} \\ &= \sqrt{5} \end{aligned}$$

$$\begin{aligned} BC &= \sqrt{(-2-2)^2 + (-11-3)^2} \\ &= \sqrt{16 + 196} \\ &= \sqrt{212} \end{aligned}$$

$$\begin{aligned} CA &= \sqrt{(1+2)^2 + (5+11)^2} \\ &= \sqrt{3^2 + 16^2} \\ &= \sqrt{9 + 256} \\ &= \sqrt{265} \end{aligned}$$

$\because AB + BC \neq CA$
 \therefore not coll.