

3 Find the shortest distance between the two circles with equations:

$$C1: (x + 2)^2 + (y - 3)^2 = 18$$

$$C2: (x - 7)^2 + (y + 6)^2 = 2$$

A 0

B 4

C 16

D $2\sqrt{2}$

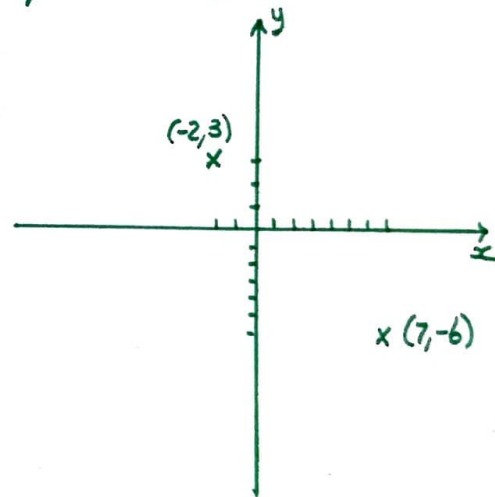
E $5\sqrt{2}$

Let C1 and C2 be labelled as above.

C1 has a centre at $(-2, 3)$ and a radius of $\sqrt{18} = \sqrt{9 \times 2} = 3\sqrt{2}$

C2 has a centre at $(7, -6)$ and a radius of $\sqrt{2}$

A quick sketch of their centres helps me to confirm that they don't intersect and thus the shortest distance between them will be the distance between their centres, minus both radii, as follows



$$\begin{aligned} & \sqrt{(-2-7)^2 + (3+6)^2} - 3\sqrt{2} - \sqrt{2} \\ &= \sqrt{9^2 + 9^2} - 4\sqrt{2} \\ &= \sqrt{9^2(2)} - 4\sqrt{2} \\ &= 9\sqrt{2} - 4\sqrt{2} \\ &= 5\sqrt{2} \end{aligned}$$

so the answer is E.