

Equation of a Circle *extend*

ANSWERS

1



Show that the points (1, 7), (5, 5), (-7, -1) all lie on one circle with its centre at the origin. Find its radius in surd form.

$$1 + 49 = 25 + 25 = 49 + 1 = 50$$

$$\sqrt{50} = 5\sqrt{2}$$

$$5\sqrt{2}$$

Answer

2



The line $y = 3$ crosses the circle $x^2 + y^2 = 20$ at A and B. Find the exact length of AB.

$$x^2 + 9 = 20, x = \pm\sqrt{11}$$

$$\sqrt{11} - (-\sqrt{11}) = 2\sqrt{11}$$

$$2\sqrt{11}$$

Answer

3



The point $(p, p + 1)$ lies on the circle $x^2 + y^2 = 13$. Find the possible values of p .

$$p^2 + p^2 + 2p + 1 = 13$$

$$p^2 + p - 6 = 0, (p + 3)(p - 2) = 0$$

$$p = 2 \text{ or } p = -3$$

Answer

4



Find the coordinates of the points where the line $y = x + 1$ meets the circle $x^2 + y^2 = 25$.

$$x^2 + (x + 1)^2 = 25$$

$$x^2 + x - 12 = 0$$

$$(x + 4)(x - 3) = 0$$

$$(3, 4) \text{ and } (-4, -3)$$

Answer

5



Find the shortest distance from the point (9, 12) to the circle $x^2 + y^2 = 49$.

$$(9, 12) \text{ to } 0: \sqrt{81 + 144} = \sqrt{225} = 15$$

$$15 - 7 = 8$$

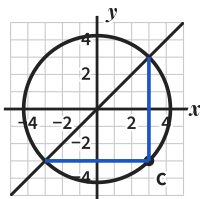
$$8 \text{ units}$$

Answer

6



The line $y = x$ meets the circle $x^2 + y^2 = 18$ at A and B. The point C is (3, -3). Find the area of triangle ABC.



$$2x^2 = 18: A(3, 3), B(-3, -3)$$

$$AC = 6, BC = 6, \frac{1}{2} \times 6 \times 6$$

$$18 \text{ square units}$$

Answer

7



How many points with whole number coordinates lie inside the circle $x^2 + y^2 = 10$, not on it?

$$x = 0: 7 \text{ points}$$

$$x = \pm 1 \text{ or } \pm 2: 5 \text{ each}$$

$$x = \pm 3: 1 \text{ each}, 7 + 20 + 2$$

$$29$$

Answer

8



Prove that the line $y = x + 6$ does not meet the circle $x^2 + y^2 = 16$.

$$x^2 + (x + 6)^2 = 16$$

$$x^2 + 6x + 10 = 0$$

$$(x + 3)^2 + 1 = 0, \text{ but } (x + 3)^2 \geq 0$$

$$\text{no solutions}$$

Reason