

07-June-2026

19 C is a circle with equation $x^2 + y^2 = 32.4 \rightarrow r = \sqrt{32.4} = 5.7$ (1 d.p.)

Point P has coordinates (a, b) where a and b are positive.

$$y = -3x + 9$$

The equation of the tangent to C at the point P is parallel to the line with equation $y = 9 - 3x$

Find the values of a and b .

$$m \text{ of radius} = \frac{1}{3}$$

$$y = \frac{1}{3}x$$

$$x = 3y$$

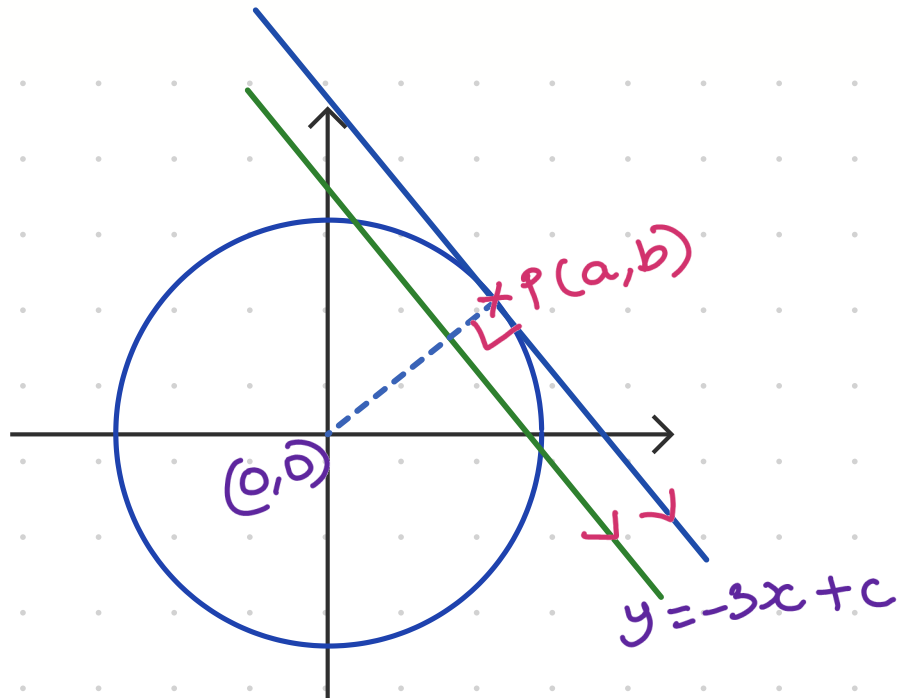
$$x^2 + y^2 = 32.4$$

$$9y^2 + y^2 = 32.4$$

$$10y^2 = 32.4$$

$$y^2 = \frac{32.4}{10}$$

$$y = \sqrt{3.24} = 1.8$$



$$b = 1.8$$

$$a = x = 3 \times 1.8$$

$$a = 5.4$$

20 The centre of a circle is the point with coordinates $(-1, 3)$

The point A with coordinates $(6, 8)$ lies on the circle.

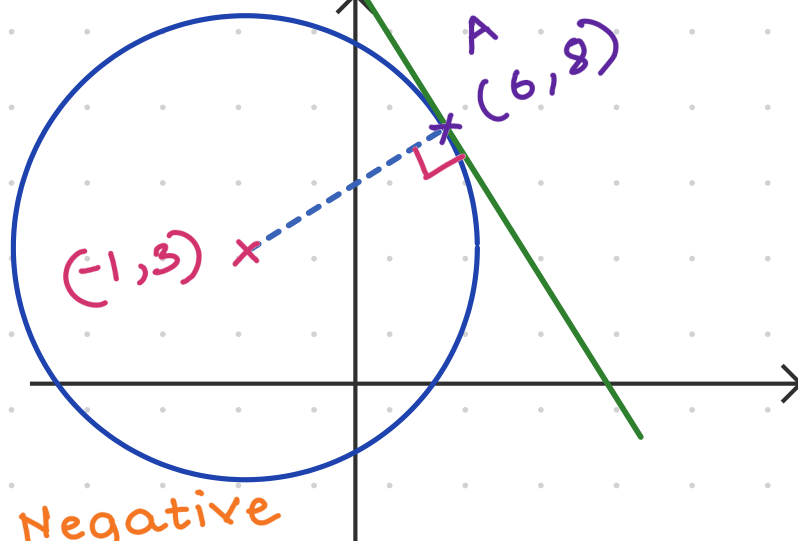
Find an equation of the tangent to the circle at A .

Give your answer in the form $ax + by + c = 0$ where a , b and c are integers.

m of radius,

$$= \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 3}{6 - (-1)}$$

$$= \frac{5}{7}$$



Negative reciprocal

m of tangent,

$$m = -\frac{7}{5}$$

$$\frac{5}{7} \times -\frac{7}{5} = -1$$

$$y = -\frac{7}{5}x + c$$

$$8 = -\frac{7}{5} \times 6 + c$$

$$8 = -\frac{42}{5} + c$$

$$c = 8 + \frac{42}{5} = \frac{40 + 42}{5} = \frac{82}{5}$$

$$y = -\frac{7}{5}x + \frac{82}{5}$$

$$+\frac{7}{5}x - \frac{82}{5}$$

$$5 \left(\frac{7}{5}x + y - \frac{82}{5} \right) = 0 \times 5$$

$$7x + 5y - 82 = 0$$



Prove algebraically that the straight line with equation $x - 2y = 10$ is a tangent to the circle with equation $x^2 + y^2 = 20$

$$x = 2y + 10$$

18 The diagram shows the locations of ships A , B and C .

Ship B is 70 km from ship A .

Ship C is

on a bearing of 064° from ship A
and on a bearing of 022° from ship B
and 85 km from ship B .

Work out the bearing of ship B from ship A .
Give your answer to 1 decimal place.

