

$$a) C(5; -2) \quad r=5$$

$$b) C(-2; 0) \quad r=8$$

$$c) C(5; -2) \quad r=0. \quad \text{C'est le point } C.'$$

$$d) C(0; 5) \quad r=\sqrt{5}$$

$$e) x^2 - 2x + y^2 + 4y = 20$$

$$\Leftrightarrow x^2 - 2 \cdot x \cdot 1 + y^2 + 2 \cdot y \cdot 2 = 20$$

$$\Leftrightarrow (x-1)^2 - 1 + (y+2)^2 - 4 = 20$$

$$\Leftrightarrow (x-1)^2 + (y+2)^2 = 25 \quad \Rightarrow C(1; -2) \\ r=5$$

$$f) x^2 - 2x + y^2 + 4y + 14 = 0$$

$$\Leftrightarrow (x-1)^2 - 1 + (y+2)^2 - 4 + 14 = 0$$

$$\Leftrightarrow (x-1)^2 + (y+2)^2 = -9$$

$\Rightarrow$  ce n'est pas un cercle.

$$g) \quad x^2 + 4x + y^2 - 2y + 5 = 0$$

$$\Leftrightarrow (x+2)^2 - 4 + (y-1)^2 - 1 + 5 = 0$$

$$\Leftrightarrow (x+2)^2 + (y-1)^2 = 0 \quad \text{C'est le point } (-2; 1)!$$

$$h) \quad x^2 + x + y^2 = 0$$

$$\Leftrightarrow x^2 + 2 \cdot x \cdot \frac{1}{2} + y^2 = 0$$

$$\Leftrightarrow \left(x + \frac{1}{2}\right)^2 - \frac{1}{4} + y^2 = 0$$

$$\Leftrightarrow \left(x + \frac{1}{2}\right)^2 + y^2 = \frac{1}{4} \quad C\left(-\frac{1}{2}; 0\right)$$

$$r = \frac{1}{2}$$

$$i) \quad x^2 + 6x + y^2 - 4y + 14 = 0$$

$$(x+3)^2 - 9 + (y-2)^2 - 4 + 14 = 0$$

$$(x+3)^2 + (y-2)^2 = -1$$

$\Rightarrow$  Ce n'est pas un cercle!

$$j) \quad x^2 + y^2 + y = 0 \quad \Leftrightarrow \quad x^2 + \left(y + \frac{1}{2}\right)^2 = \frac{1}{4}$$

$$\Leftrightarrow \quad x^2 + y^2 + 2 \cdot y \cdot \frac{1}{2} = 0 \quad C\left(0; -\frac{1}{2}\right)$$

$$\Leftrightarrow \quad x^2 + \left(y + \frac{1}{2}\right)^2 - \frac{1}{4} = 0 \quad r = \frac{1}{2}$$

$$k) \quad x^2 + y^2 - \frac{3}{2}x + y + \frac{17}{80} = 0$$

$$\Leftrightarrow \quad x^2 - 2 \cdot x \cdot \frac{3}{4} + y^2 + 2 \cdot y \cdot \frac{1}{2} + \frac{17}{80} = 0$$

$$\Leftrightarrow \quad \left(x - \frac{3}{4}\right)^2 - \frac{9}{16} + \left(y + \frac{1}{2}\right)^2 - \frac{1}{4} + \frac{17}{80} = 0$$

$$\Leftrightarrow \quad \left(x - \frac{3}{4}\right)^2 + \left(y + \frac{1}{2}\right)^2 = \frac{9}{16} + \frac{1}{4} - \frac{17}{80}$$

$$C\left(\frac{3}{4}; -\frac{1}{2}\right) \quad = \frac{48}{80} = \frac{3}{5}$$

$$r = \sqrt{\frac{3}{5}}$$

$$c) \quad x^2 + y^2 - \frac{216}{144}x + \frac{192}{144}y = -\frac{145}{144}$$

$$\Leftrightarrow x^2 + y^2 - \frac{3}{2}x + \frac{4}{3}y = -\frac{145}{144}$$

$$\Leftrightarrow x^2 - 2x \cdot \frac{3}{4} + y^2 + 2 \cdot y \cdot \frac{2}{3} = -\frac{145}{144}$$

$$\Leftrightarrow \left(x - \frac{3}{4}\right)^2 + \left(y + \frac{2}{3}\right)^2 - \frac{9}{16} - \frac{4}{9} = -\frac{145}{144}$$

$$\Leftrightarrow \left(x - \frac{3}{4}\right)^2 + \left(y + \frac{2}{3}\right)^2 = \frac{9}{16} + \frac{4}{9} - \frac{145}{144}$$

$$\Leftrightarrow \left(x - \frac{3}{4}\right)^2 + \left(y + \frac{2}{3}\right)^2 = 0$$

Il s'agit du point  $\left(\frac{3}{4}; -\frac{2}{3}\right)$  !