$$x^2 + y^2 + ax + by + c = 0$$

CENTRO $C(\alpha, \beta)$ $\qquad \alpha = -\frac{a}{2}$

RAGGIO $r > 0$ $\qquad \beta = -\frac{b}{2}$

$$r = \sqrt{\alpha^2 + \beta^2 - c}$$

$$r = \sqrt{\frac{a^2}{4} + \frac{b^2}{4} - c}$$

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$C(0,0)$

$r = 2$

$P(x,y)$ $\quad \overline{PC} = r \rightsquigarrow \overline{PC}^2 = r^2$

$(x-0)^2 + (y-0)^2 = 2^2$

$\boxed{x^2 + y^2 = 4}$

$\alpha = -\frac{a}{2}$

$\beta = -\frac{b}{2}$

$r = \sqrt{\alpha^2 + \beta^2 - c}$

ALTRO MODO

$$\begin{cases} 0 = -\frac{a}{2} \\ 0 = -\frac{b}{2} \\ 2 = \sqrt{0^2 + 0^2 - c} \end{cases} \qquad \begin{cases} a = 0 \\ b = 0 \\ \sqrt{-c} = 2 \end{cases}$$

$c = -4$

$\boxed{x^2 + y^2 - 4 = 0}$

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$r = \sqrt{5}$

$C(-3, 1)$

$$(x-\alpha)^2 + (y-\beta)^2 = r^2$$

$$(x+3)^2 + (y-1)^2 = 5$$

$$x^2 + 6x + 9 + y^2 - 2y + 1 - 5 = 0$$

$$\boxed{x^2 + y^2 + 6x - 2y + 5 = 0}$$

Determinare il centro e il raggio della circonferenza

$a = -4 \quad b = 1 \quad c = -1$

$$x^2 + y^2 - 4x + y - 1 = 0$$

$$\alpha = -\frac{a}{2} = -\frac{-4}{2} = 2 \qquad \beta = -\frac{b}{2} = -\frac{1}{2}$$

$$C\left(2, -\frac{1}{2}\right)$$

$$r = \frac{\sqrt{21}}{2}$$

$$r = \sqrt{\alpha^2 + \beta^2 - c} =$$

$$= \sqrt{4 + \frac{1}{4} + 1} =$$

$$= \sqrt{\frac{16 + 1 + 4}{4}} = \sqrt{\frac{21}{4}} = \frac{\sqrt{21}}{\sqrt{4}}$$

$$x^2 + y^2 - x + y + 5 = 0$$

$$\alpha = -\frac{-1}{2} = \frac{1}{2}$$

$$\beta = -\frac{1}{2}$$

$$r = \sqrt{\frac{1}{4} + \frac{1}{4} - 5} =$$

$$= \sqrt{\frac{1+1-20}{4}} = \sqrt{-\frac{18}{4}}$$

NON RAPPRESENTA UNA CIRCONFERENZA!

NESSUN PUNTO (x,y) SODDISFA L'EQUAZIONE!

< 0 NEGATIVO!

$$x^2+y^2-4x-6y+13=0$$

$$\alpha = -\frac{a}{2} = 2$$

$$\beta = -\frac{b}{2} = 3$$

$$R = \sqrt{4+9-13} = 0$$

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

NON RAPPRESENTA UNA CIRCONFERENZA, MA IL PUNTO

$(\alpha, \beta) = (2, 3)$

CIRCONFERENZA DEGENERE (RAGGIO 0)