Scrivi l'equazione della circonferenza passante per l'origine e tangente in $A(1; 2)$ alla retta di equazione $y = -3x + 5$. $\qquad [x^2 + y^2 + x - 3y = 0]$

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

$O(0,0) \to \begin{cases} c = 0 \\ \\ 1 + 4 + a + 2b = 0 \end{cases}$ $\begin{cases} c = 0 \\ \\ a + 2b + 5 = 0 \implies a = -2b - 5 \end{cases}$

$A(1,2) \to$

$$\begin{cases} x^2 + y^2 + ax + by = 0 \\ \\ y = -3x + 5 \end{cases}$$

$$x^2 + (-3x + 5)^2 + ax + b(-3x + 5) = 0$$

$$x^2 + 9x^2 + 25 - 30x + ax - 3bx + 5b = 0$$

$$10x^2 + (a - 30 - 3b)x + 25 + 5b = 0$$

$\Delta = 0 \qquad (a - 30 - 3b)^2 - 40(25 + 5b) = 0$

$\qquad\qquad\quad \uparrow$
$\qquad -2b - 5$

$$(-5b - 35)^2 - 1000 - 200b = 0$$

$\qquad\qquad \downarrow$

$$\left[(-5)(b + 7)\right]^2$$

$$25(b^2 + 49 + 14b) - 1000 - 200b = 0$$

$$b^2 + 49 + 14b - 40 - 8b = 0$$

$$b^2 + 6b + 9 = 0 \qquad (b + 3)^2 = 0 \implies b = -3$$

$\begin{cases} a = -2b - 5 = 6 - 5 = 1 \\ b = -3 \\ c = 0 \end{cases}$ $\boxed{x^2 + y^2 + x - 3y = 0}$

Dato il triangolo di vertici $A(1; 2)$, $B(-7; 6)$ e $C(-1; 0)$, determina l'equazione della circonferenza circoscritta e quella della circonferenza con centro in C e tangente alla retta AB.

$$[x^2 + y^2 + 6x - 8y + 5 = 0;$$
$$5x^2 + 5y^2 + 10x - 31 = 0]$$

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

$$
A \quad \begin{cases} 1+4+a+2b+c=0 \\ 49+36-7a+6b+c=0 \\ 1 \quad -a \quad +c=0 \end{cases}
\qquad
\begin{cases} 5+a+2b+a-1=0 \\ 85-7a+6b+a-1=0 \\ c=a-1 \end{cases}
$$

$$
\begin{cases} 2a+2b=-4 \rightarrow a+b=-2 \\ -6a+6b=-84 \rightarrow -a+b=-14 \\ /\!/ \end{cases}
\qquad
\begin{cases} a=-b-2 \\ b+2+b=-14 \\ /\!/ \end{cases}
$$

$$
\begin{cases} 2b=-16 \implies \begin{cases} a=6 \\ b=-8 \\ c=5 \end{cases} \end{cases}
\qquad
\boxed{x^2+y^2+6x-8y+5=0}
$$
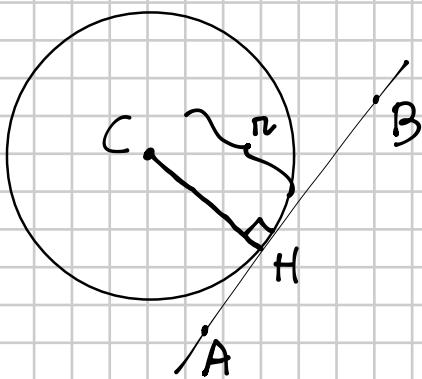
$A(1,2) \quad B(-7,6)$

$$\frac{y-2}{6-2} = \frac{x-1}{-7-1}$$

$$\frac{y-2}{1 \cancel{4}} = \frac{x-1}{\cancel{-8}-2}$$

$C(-1,0)$

$-2y+4 = x-1 \qquad x+2y-5=0$

$$r = d(C, AB) = \frac{|-1+2\cdot0-5|}{\sqrt{1^2+2^2}} = \frac{6}{\sqrt{5}}$$

CIRC.

$$(x+1)^2 + (y-0)^2 = \frac{36}{5}$$

$$x^2+1+2x+y^2-\frac{36}{5}=0 \qquad \boxed{5x^2+5y^2+10x-31=0}$$

83 $x^2 + y^2 + |2x - 2| + 4y = 0$ Rappresentare graficamente

$2x - 2 \geqslant 0 \implies |2x - 2| = 2x - 2$
$\quad x \geqslant 1$

$2x - 2 < 0 \implies |2x - 2| = -2x + 2$
$\quad x < 1$

$$\begin{cases} x^2 + y^2 + 2x - 2 + 4y = 0 & \text{se} \quad x \geqslant 1 \\ \\ x^2 + y^2 - 2x + 2 + 4y = 0 & \text{se} \quad x < 1 \end{cases}$$

① $\begin{cases} x^2 + y^2 + 2x + 4y - 2 = 0 & \text{se} \quad x \geqslant 1 \\ \\ x^2 + y^2 - 2x + 4y + 2 = 0 & \text{se} \quad x < 1 \end{cases}$

②

① $C_1(-1, -2) \quad r_1 = \sqrt{1 + 4 + 2} = \sqrt{7}$

② $C_2(1, -2) \quad r_2 = \sqrt{1 + 4 - 2} = \sqrt{3}$