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$$y = 1 + \sqrt{|x| - x^2}$$

$$y - 1 = \sqrt{|x| - x^2}$$

$$y - 1 \geq 0 \Rightarrow y \geq 1$$

$$|x| = \begin{cases} x & \text{se } x \geq 0 \\ -x & \text{se } x < 0 \end{cases}$$

$$x < 0 \Rightarrow y - 1 = \sqrt{-x - x^2} \quad [1]$$

$$x \geq 0 \Rightarrow y - 1 = \sqrt{x - x^2} \quad [2]$$

$$[1] \quad y - 1 = \sqrt{-x - x^2} \quad y \geq 1$$

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

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

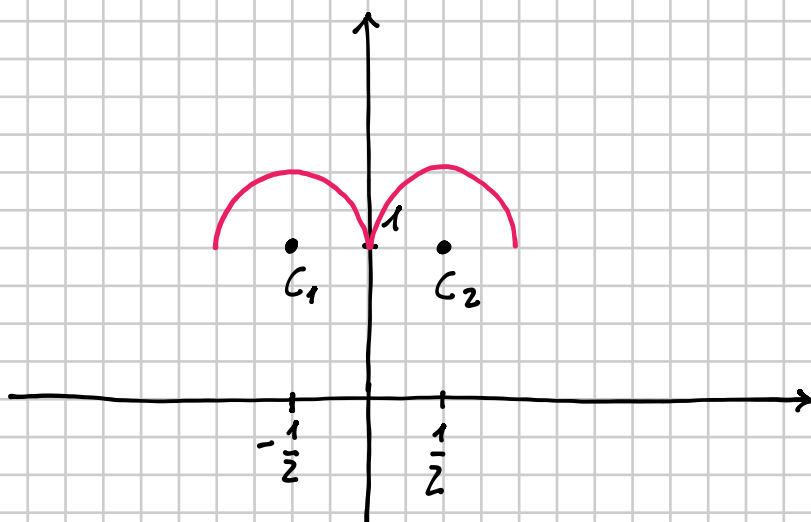
$$C_1\left(-\frac{1}{2}, 1\right) \quad r_1 = \sqrt{\frac{1}{4} + 1 - 1} = \frac{1}{2}$$

$$[2] \quad y - 1 = \sqrt{x - x^2} \quad y \geq 1$$

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

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

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

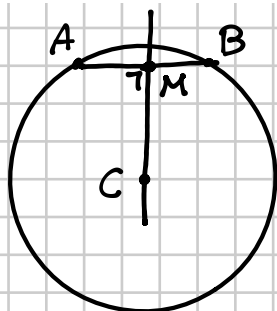


$M(1; 4)$  è il punto medio della corda  $AB$  nella circonferenza di equazione

$$x^2 + y^2 - 4x - 6y + 3 = 0.$$

Trova le coordinate di  $A$  e di  $B$ .

$$[A(-1; 2), B(3; 6)]$$



$$m_{CH} = \frac{4-3}{1-2} = -1$$

retta  $AB$  (perpendicolare alla retta  $CH$ )  
passante per  $M$

$$y - 4 = 1 \cdot (x - 1)$$

↑  
coeff. angolare reciproco di -1

$A, B$  sono le intersezioni fra  
la circonferenza e la retta  $AB$

$$y = x + 3$$

$$\begin{cases} y = x + 3 \\ x^2 + y^2 - 4x - 6y + 3 = 0 \end{cases}$$

$$\begin{cases} y = x + 3 \\ x^2 + (x+3)^2 - 4x - 6(x+3) + 3 = 0 \end{cases}$$

$$x^2 + x^2 + 3 + 6x - 4x - 6x - 18 + 3 = 0$$

$$2x^2 - 4x - 6 = 0$$

$$x^2 - 2x - 3 = 0$$

$$(x-3)(x+1) = 0 \quad \begin{matrix} \nearrow x=3 \\ \searrow x=-1 \end{matrix}$$

$$\begin{cases} x = -1 \\ y = 2 \end{cases}$$

$$\vee \begin{cases} x = 3 \\ y = 6 \end{cases}$$

$$\boxed{A(-1, 2) \quad B(3, 6)}$$

Determina l'equazione della circonferenza di centro  $C(-3; 0)$  e raggio 5 e scrivi le equazioni delle rette tangenti condotte dal punto  $P(7; 5)$ .

$$[x^2 + y^2 + 6x - 16 = 0; y = 5; 4x - 3y - 13 = 0]$$

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

$$x^2 + 9 + 6x + y^2 - 25 = 0$$

$$x^2 + y^2 + 6x - 16 = 0$$

FASCIO DI RETTE PER  $P(7, 5)$

$$y - 5 = m(x - 7)$$

$$y = mx - 7m + 5$$

1° MODO

$$\begin{cases} y = mx - 7m + 5 \\ x^2 + y^2 + 6x - 16 = 0 \end{cases} \quad \begin{cases} y = mx - 7m + 5 \\ x^2 + (mx - 7m + 5)^2 + 6x - 16 = 0 \end{cases}$$

$$x^2 + m^2 x^2 + 49m^2 + 25 - 14m^2 x + 10mx - 70m + 6x - 16 = 0$$

$$(1+m^2)x^2 - 2(7m^2 - 5m - 3)x + 49m^2 - 70m + 9 = 0$$

$$\frac{\Delta}{4} = 0 \Rightarrow (7m^2 - 5m - 3)^2 - (1+m^2)(49m^2 - 70m + 9) = 0$$

$$\cancel{49m^4} + \cancel{25m^2} + \cancel{9} - \cancel{70m^3} - \cancel{42m^2} + \cancel{30m} - \cancel{49m^2} + \cancel{70m} - \cancel{9} - \cancel{49m^4} + \cancel{70m^3} - \cancel{9m^2} = 0$$

$$-75m^2 + 100m = 0$$

$$3m^2 - 4m = 0 \quad m(3m - 4) = 0 \quad \begin{matrix} \nearrow m = 0 \\ \searrow m = \frac{4}{3} \end{matrix}$$

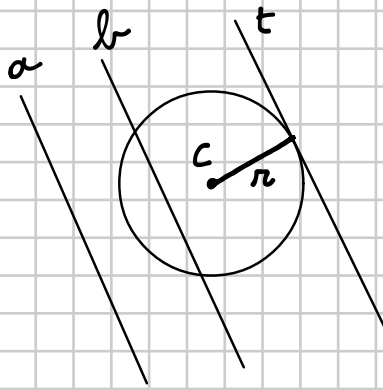
$$y = mx - 7m + 5$$

$$y = 5$$

$$y = \frac{4}{3}x - 7 \cdot \frac{4}{3} + 5 = \frac{4}{3}x - \frac{13}{3}$$

$$y = \frac{4}{3}x - \frac{13}{3}$$

2° caso



$$d(C, t) = r \quad \text{TANGENTE}$$

$$d(C, a) > r \quad \text{ESTERNA}$$

$$d(C, b) < r \quad \text{SECANTE}$$

FASCI

$$y = mx - 7m + 5 \Rightarrow mx - y - 7m + 5 = 0 \quad (\text{in forma implicita})$$

CIRC.  $C(-3, 0) \quad r = 5$

IMPOSTO DISTANZA CENTRO-RETTA UGUALE AL RAGGIO

$$\frac{|m(-3) - 0 - 7m + 5|}{\sqrt{m^2 + 1}} = 5$$

$$\frac{|-3m - 7m + 5|}{\sqrt{m^2 + 1}} = 5$$

$$\frac{|-10m + 5|}{\sqrt{m^2 + 1}} = 5$$

$$|-10m + 5| = 5\sqrt{m^2 + 1} \quad \downarrow \text{elevo al quadrato}$$

$$100m^2 + 25 - 100m = 25(m^2 + 1)$$

$$4m^2 + 1 - 4m = m^2 + 1$$

$$3m^2 - 4m = 0 \quad \begin{array}{l} \nearrow m = 0 \\ \searrow m = \frac{4}{3} \end{array}$$

COME PRIMA