12/1/2018

PAG. 373 N 159

$$\begin{cases} x^2+y^2-2y=0 \\ y=kx-1 \end{cases}$$

$$x^2+(kx-1)^2-2(kx-1)=0$$

$$x^2+k^2x^2+1-2kx-2kx+2=0$$

$$(1+k^2)x^2-4kx+3=0$$

$$\Delta \geq 0 \rightarrow \frac{\Delta}{4} \geq 0$$

$$(-2k)^2-3(1+k^2) \geq 0$$

$$4k^2-3-3k^2 \geq 0$$

$$k^2 \geq 3$$

$$\boxed{k \leq -\sqrt{3} \quad \vee \quad k \geq \sqrt{3}}$$

N 139

$P\left(\frac{2}{3}, 4\right)$

$x^2+y^2-18x-8y+72=0$

$C(9,4)$

$r=\sqrt{81+16-72}=5$

$y-4=m\left(x-\frac{2}{3}\right)$

$y-4=mx-\frac{2}{3}m$

$mx-y+4-\frac{2}{3}m=0$

$$\frac{\left|9m\cancel{-4}\cancel{+4}-\frac{2}{3}m\right|}{\sqrt{m^2+1}}=5$$

$\left|\frac{25}{3}m\right|=5\sqrt{m^2+1}$

$\frac{5\,\cancel{25}}{3}|m|=\cancel{5}\sqrt{m^2+1}$

$\frac{25}{9}m^2=m^2+1$ $\qquad$ $\frac{16}{9}m^2=1$

$m=\pm\frac{3}{4}$

1) $m=-\frac{3}{4}$ $\qquad$ $-\frac{3}{4}x-y+4-\frac{\cancel{2}}{\cancel{3}}\left(-\frac{\cancel{3}}{\cancel{4}_2}\right)=0$

$-\frac{3}{4}x-y+4+\frac{1}{2}=0$

$\boxed{3x+4y-18=0}$

2) $m=\frac{3}{4}$ $\qquad$ $\frac{3}{4}x-y+4-\frac{\cancel{2}}{\cancel{3}}\cdot\frac{\cancel{3}}{\cancel{4}_2}=0$ $\qquad$ $\boxed{3x-4y+14=0}$

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Trovare le tangenti comuni

$$x^2+y^2-2y-\frac{4}{5}=0 \qquad x^2+y^2+6y-\frac{4}{5}=0$$

DA TROVARE $\rightarrow$ $y=mx+q$ (DA TROVARE m E q)

CENTRO E RAGGIO DELLA 1°

$C(0,1)$ $r=\sqrt{1+\frac{4}{5}}=\frac{3}{\sqrt5}$

CENTRO E RAGGIO DELLA 2°

$C(0,-3)$ $r=\sqrt{9+\frac{4}{5}}=\frac{7}{\sqrt5}$

$$mx-y+q=0$$

$$\frac{|-1+q|}{\sqrt{m^2+1}}=\frac{3}{\sqrt5} \qquad \frac{|3+q|}{\sqrt{m^2+1}}=\frac{7}{\sqrt5}$$

$$\begin{cases}\sqrt5\,|q-1|=3\sqrt{m^2+1}\\ \sqrt5\,|q+3|=7\sqrt{m^2+1}\end{cases}$$

$$\frac{\cancel{\sqrt5}|q-1|}{\cancel{\sqrt5}|q+3|}=\frac{3\cancel{\sqrt{m^2+1}}}{7\cancel{\sqrt{m^2+1}}}$$

$$7|q-1|=3|q+3|$$

$$49(q^2+1-2q)=9(q^2+9+6q)$$

$$40q^2-32-152q=0$$

$$10q^2-8-38q=0$$

$$5q^2-19q-4=0$$

$$q=\frac{19\pm\sqrt{361+80}}{10}=$$

$$=\frac{19\pm21}{10}=\begin{cases}-\frac{1}{5}\\4\end{cases}$$

$q=-\frac{1}{5}$

$$\sqrt5\left|-\frac{1}{5}-1\right|=3\sqrt{m^2+1}$$

$$\sqrt5\cdot\frac{\overset{2}{\cancel{6}}}{5}=\cancel{3}\sqrt{m^2+1}$$

$$\cancel{5}\cdot\frac{4}{\underset{5}{\cancel{25}}}=m^2+1$$

$$m^2=\frac{4}{5}-1=-\frac{1}{5}$$

IMPOSSIBILE

$\sqrt{5}\,|q-1| = 3\sqrt{m^2+1}$

$q=4 \implies \quad \cancel{3}\sqrt{5} = \cancel{3}\sqrt{m^2+1}$

$m^2+1=5 \qquad m^2=4 \qquad m=\pm 2$

$\begin{cases} m=2 \\ q=4 \end{cases} \quad \vee \quad \begin{cases} m=-2 \\ q=4 \end{cases}$

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