

$$x^2 - \frac{65}{8}x - 1 = 0$$

$$8x^2 - 65x - 8 = 0$$

$$\Delta = 4225 + 256 > 0$$

$$x_1 + x_2 = -\frac{b}{a} = \frac{65}{8}$$

$$x_1 x_2 = \frac{c}{a} = -\frac{8}{8} = -1$$

Regole di Cartesio

$$ax^2 + bx + c = 0 \quad \Delta \geq 0$$

$$x^2 - 5x + 6 = 0$$

$$x_1 = 2$$

$$x_2 = 3$$

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

$$\Delta = 1 + 8 = 9$$

$$x_{1,2} = \frac{1 \pm 3}{4} \begin{matrix} \nearrow x_1 = 1 \\ \searrow x_2 = -\frac{1}{2} \end{matrix}$$

## Eg. parametrische

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

$$1) \Delta \geq 0$$

$$\Delta = (k+3)^2 - k(k-1) =$$

$$= \cancel{k^2} + 9 + 6k - \cancel{k^2} - k \geq 0$$

$$5k + 9 \geq 0; \quad k \geq -\frac{9}{5}$$

$$2) x_1 = -x_2 \Rightarrow x_1 + x_2 = 0$$

$$x_1 + x_2 = -\frac{b}{a} = \frac{2(k+3)}{k} = 0$$

$$k = -3$$

$$3) x_1 = -\frac{1}{x_2} \Rightarrow x_1 x_2 = -1$$

$$x_1 x_2 = \frac{k-1}{k} = -1$$

$$k-1 = -k \Rightarrow 2k = 1 \Rightarrow k = \frac{1}{2}$$

$$4) x_1 x_2 > 0$$

$$\frac{k-1}{k} > 0 \quad N > 0 \quad k > 1$$

$$D > 0 \quad k > 0$$

0	1
-	-
+	+

$$k < 0 \vee k > 1$$

$$5) x_1^2 + x_2^2 = 4$$

$$(x_1 + x_2)^2 - 2x_1 x_2 = 4$$

$$\left[ \frac{2(k+3)}{k} \right]^2 - 2 \left( \frac{k-1}{k} \right) = 4$$

$$\frac{4k^2 + 24k + 36}{k^2} - \frac{2k-2}{k} = 4 \quad k \neq 0$$

$$\cancel{4k^2} + 24k + 36 - 2k^2 + 2k = \cancel{4k^2}$$

$$2k^2 - 26k - 36 = 0$$

$$k^2 - 13k - 18 =$$

$$\Delta = 169 + 72 = 241$$

$$k_{1,2} = \frac{13 \pm \sqrt{241}}{2}$$

$$6) x_1^2 x_2^2 = 1$$

$$(x_1 x_2)^2 = 1$$

$$\left(\frac{c}{a}\right)^2 = 1 \quad \left(\frac{k-1}{k}\right)^2 = 1$$

$$\cancel{k^2} - 2k + 1 = \cancel{k^2} \quad k = \frac{1}{2}$$

$$7) x_1^3 + x_2^3 = 2$$

$$8) x_1 = 2x_2$$

$$9) \frac{1}{x_1} + \frac{1}{x_2} = 3 \quad \frac{x_1 + x_2}{x_1 x_2} = 3$$

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$$(m-1)x^2 - 2mx + 4 = 0 \quad m \neq 1$$

$$\Delta = \frac{m^2 - 4(m-1)}{4} = \frac{m^2 - 4m + 4}{4} = \frac{(m-2)^2}{4}$$

$$x_1 + x_2 = \frac{2m}{m-1}$$

$$x_1 x_2 = \frac{4}{m-1}$$

a)  $x_1 - x_2 = 0 \Rightarrow x_1 = x_2$

$$(m-2)^2 = 0 \Rightarrow m = 2$$

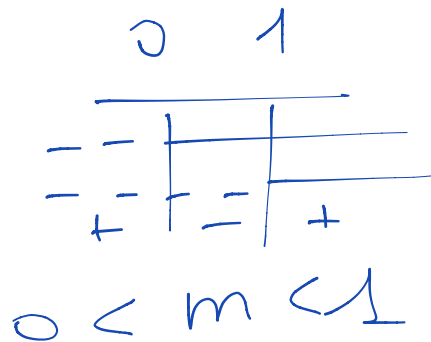
b)  $x_1 x_2 = 3(x_1 + x_2)$

$$\frac{4}{m-1} = \frac{6m}{m-1} \Rightarrow m = \frac{4}{6} = \frac{2}{3}$$

c)  $\begin{cases} x_1 + x_2 < 0 \\ x_1 x_2 > 0 \end{cases}$

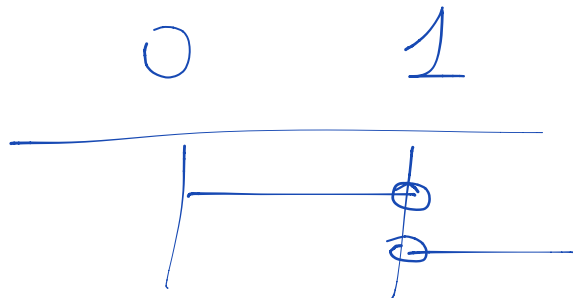
$$\begin{cases} \frac{2m}{m-1} < 0 \\ \frac{4}{m-1} > 0 \end{cases}$$

$$1) \begin{cases} N > 0 & m > 0 \\ D > 0 & m > 1 \end{cases}$$



$$2) m > 1$$

$$\exists m \in \mathbb{R}$$



$$d) \begin{cases} X_1 = 0 \\ 4 = 0 \end{cases}$$

$$\exists m \in \mathbb{R}$$