

$$\left(\frac{1}{2}\right)^{2x} - 5 \cdot \left(\frac{1}{2}\right)^x + 4 = 0$$

$$t = \frac{1}{2}^x$$

$$\rightarrow 2^{-2x} - (5 \cdot 2^{-2x}) + 4 = 0$$

$$t^2 - 5t + 4 = 0$$

$$5^{2x} + 8 \cdot 5^{2x} \leq 2$$

$$\Delta = 25 - 4(4) = 9$$

$$5^{2x}(1 + 8) \leq 2$$

$$x_1, x_2 = \frac{5 \pm 3}{2} \rightarrow \begin{matrix} 8/2 = 4 \\ -2/2 = -1 \end{matrix}$$

$$\frac{5^{2x}(10)}{10} \leq 2 \quad \pi 0$$

$$t_1 = 1 \vee t_2 = 4$$

↑
(E / AND)

$$5^{2x} \leq \frac{1}{5}$$

$$5^{2x} \leq 5^{-1}$$

$$\left(\frac{1}{2}\right)^x = 1 \quad 2^{-x} = 2^0$$

$$\rightarrow x = 0$$

$$\left(\frac{1}{2}\right)^x = 4$$

$$\frac{2^x \leq -1}{2} \quad \frac{2^x \leq -1}{2}$$

$$\rightarrow 2^{-x} = 2^2 \rightarrow -x = 2$$

$$\frac{4}{2^{x-1}} + \frac{3}{2^{x+1}} = 5 \quad x = -1$$

$$(2^x - 1) \cancel{(2^x + 1)} \frac{4(2^x + 1) + 3(2^x - 1)}{(2^x - 1) \cancel{(2^x + 1)}} = 5 (2^x - 1) (2^x + 1)$$

$$4(2^x + 1) + 3(2^x - 1) = 5(2^x - 1)(2^x + 1)$$

$$8^x + 4 + 6^x - 3 = 5(2^{2x} + 2^x - 2^x - 1)$$

$$14^x + 1 = 10^{2x} - 5$$

$$14^x - 10^{2x} + 6 = 0$$

$$\begin{array}{r} 14 \overline{) 2} \\ 7 \overline{) 7} \\ 1 \end{array}$$

$$2 \cdot 7 = 14$$

$$\rightarrow (2^x \cdot 7) - (2^{2x} \cdot 5) + 6$$

$$\begin{array}{r} 10 \overline{) 2} \\ 5 \overline{) 5} \\ 1 \end{array}$$

$$2 \cdot 5 = 10$$

$$\rightarrow -5t^2 + 7t + 6 = 0$$

$$\Delta = 49 - 4(6 \cdot -5)$$

$$= 49 - 4(-20) = 49 + 120 = 169 = 13^2$$

$$x_1, x_2 = \frac{-7 \pm 13}{-10} \quad \begin{matrix} -20/-10 = 2 \\ 6/-10 = -3/5 \end{matrix}$$

$$t_1 = 2$$

$$\rightarrow 2^x = 2^1 \rightarrow x = 1$$

$$t_2 = -\frac{3}{5}$$

$$\rightarrow 2^x = -\frac{3}{5} \rightarrow \text{impossibile}$$

$$25 \left(\frac{1}{5}\right)^x + 5 - 2 \left(\frac{1}{5}\right)^{-x} \leq 0$$

$$5^2 (5^{-x}) + 5 - 2 (5^x) \leq 0$$

$$5^{-x} (5^x - 5) (5^x + \frac{5}{2}) \geq 0 \quad t = 5^x$$

$$\frac{1}{t} (t - 5) (t + \frac{5}{2}) \geq 0$$

$$k - \frac{1}{2} = 0$$

$$\frac{1}{k} (k^2 + \frac{5}{2}k - \frac{25}{2}) \geq 0$$

$$k + \frac{5}{2} - \frac{25}{2k} \geq 0$$

$$k - \frac{25}{2k} - 5 \geq 0$$

$$k - \frac{25}{2k} \geq 5$$

$$\frac{2k - 25}{2} \geq 5$$

$$- \frac{25}{2}$$

$$\frac{10}{k} \geq 5 \rightarrow 5k \geq 5 \rightarrow k \geq 1$$

$$\frac{2(2x-1)^2 - 3(x-1) + x^2 + 3 + 4x}{12} \geq 1 \quad | \quad x \leq -\frac{1}{5} \vee x \geq \frac{1}{2}$$

$$\frac{2(2x-1)^2 - 3(x-1) + x^2 + 3 + 4x}{12} - 1 \geq 0$$

$$\frac{2(4x^2 + 1 - 4x) - 3x + 3 + x^2 + 6 + 8x - 12}{12} \geq 0$$

$$\frac{8x^2 + 2 - 3x - 3x + 3 + 2x^2 + 6 + 8x - 12}{12} \geq 0$$

$$10x^2 - 3x - 1 \geq 0$$

$$b^2 - 4ac = 9 - 4(-1 \cdot 10) = 9 + 40 = 49 = 7^2$$

$$x = \frac{3 \pm 7}{2 \cdot 10} = \frac{3 \pm 7}{20} < \frac{10}{20} = \frac{1}{2}$$

$$x \leq -\frac{1}{5} \vee x \geq \frac{1}{2}$$

$$\frac{10-3x}{x-3} - \frac{15}{x-2} \leq \frac{3(x^2+1)+21}{x^2-5x+6} \quad | \quad x \leq -\frac{1}{5} \vee \frac{1}{2} \leq x < 2 \vee x > 3$$

$$c.c. \begin{cases} x-3 \neq 0 & \rightarrow x \neq 3 \\ x-2 \neq 0 & \rightarrow x \neq 2 \\ x^2-5x+6 \neq 0 & \rightarrow x \neq 2 \vee x \neq 3 \end{cases}$$

$$b = 25 - 24 = 1 \rightarrow x = \frac{5 \pm 1}{2} < \frac{6}{2} = 3$$

$$\frac{10-3x}{x-3} - \frac{15}{x-2} \leq \frac{3(x^2+1)+21}{(x-3)(x-2)} \rightarrow (x-3)(x-2) \geq 0$$

$$\frac{(10-3x)(x-2) - 15(x-3)}{(x-3)(x-2)} \leq \frac{3(x^2+1)+21}{(x-3)(x-2)}$$

$$\frac{10x - 20 - 3x^2 + 6x - 15x + 45}{(x-3)(x-2)} \leq \frac{3x^2 + 24}{(x-3)(x-2)}$$

$$\frac{10x - 20 - 3x^2 + 6x - 15x + 45 - 3x^2 - 24}{(x-3)(x-2)} \leq 0$$

$$\frac{-6x^2 + x + 1}{(x+3)(x-2)} \leq 0$$

$$-6x^2 + x + 1 \leq 0$$

$$D = 1 - 4(-6 \cdot 1) = 25 = 5^2$$

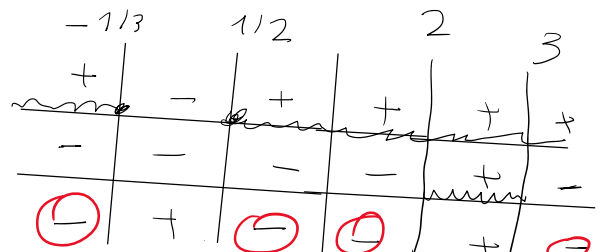
$$41 - 12 = 11 - 3 = -113$$

$$x = \frac{-1 \pm 5}{-12} \quad \begin{cases} 41 - 12 = 11 - 3 = -113 \\ -61 - 12 = 112 = 112 \end{cases}$$

$$x \leq -113 \vee x \geq 112$$

$$(x-3)(x-2) \leq 0$$

$$x^2 - 5x + 6 \leq 0$$



$$Cx \rightarrow (x-2) \leq 0$$

$$x^2 - 5x + 6 \leq 0$$

$$x_1 = 3$$

$$x_2 = 2$$

$$2 \leq x \leq 3$$

$$\begin{array}{c|c|c|c|c|c} \ominus & + & \ominus & \ominus & + & \ominus \end{array}$$

$$x \leq -\frac{1}{3} \vee \frac{1}{2} \leq x < 2 \vee x > 3$$

$$\begin{cases} \frac{x^2 - 2x}{(x+1)(x-2)} \geq 0 \\ \frac{x+1}{x^2-9} < \frac{1}{x+3} \end{cases}$$

$$-1 < x \leq 0 \vee 2 \leq x < 3$$

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③ RISOLVI

④ STUDIO DEL SEGNO CON SOL. COMUNI

$$\begin{cases} x \geq 2 \\ x \leq 3 \end{cases} \rightarrow \begin{array}{c} 2 \\ 3 \end{array}$$

→ NON GUARDO SEGNI, MA "PERI COMUNI"

Determina le equazioni delle rette tangenti alla parabola di equazione $y = \frac{x^2}{2} - x$ nei suoi punti di intersezione con l'asse x.

$$x+y=0; x-y-2=0$$

$$\begin{cases} y = \frac{x^2}{2} - x \\ y = 0 \end{cases}$$

$$\frac{x^2}{2} - x = 0$$

$$x^2 - x = 0$$

$$x(x-1) = 0$$

$$x = 0$$

$$x = 1$$

$$ax+by+c=0$$

$$y=mx+q$$

$$y = f(x_0)(x-x_0) - f(x_0)$$

$$y_1 = (x-0) - 0 \rightarrow y = x \quad x+y=0$$

$$y_2 = 1(x-1) - f(1) = x - y - 2$$