

14/4/2021

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$$\frac{|2x-3|-x-1}{4x^2-2x} < 0 \quad \left[0 < x < \frac{1}{2} \vee \frac{2}{3} < x < 4 \right]$$

$$|2x-3|-x-1 > 0$$

$$|2x-3| > x+1$$

$$2x-3 < -(x+1) \quad \vee \quad 2x-3 > x+1$$

$$2x-3 < -x-1 \quad \vee \quad x > 4$$

$$3x < 2$$

$$x < \frac{2}{3}$$

$$x < \frac{2}{3} \quad \vee \quad x > 4$$

$$4x^2-2x > 0$$

$$2x(2x-1) > 0 \quad x < 0 \quad \vee \quad x > \frac{1}{2}$$

$$x_1 = 0 \quad x_2 = \frac{1}{2}$$

$$x < \frac{2}{3} \quad \vee \quad x > 4$$

$$x < 0 \quad \vee \quad x > \frac{1}{2}$$

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

$$0 < x < \frac{1}{2} \quad \vee \quad \frac{2}{3} < x < 4$$

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$$\frac{|x^2 + 4| - 1}{|x^2 - 4x| - 3x} \leq 0$$

$[1 < x < 7]$

N) $|x^2 + 4| - 1 > 0$ dato che $x^2 + 4 > 0 \forall x$,
allora $|x^2 + 4| = x^2 + 4$

$$x^2 + 4 - 1 > 0$$

$$x^2 + 3 > 0 \quad \forall x \in \mathbb{R}$$

D) $|x^2 - 4x| - 3x > 0$

$$|x^2 - 4x| > 3x$$

$$x^2 - 4x < -3x \quad \vee \quad x^2 - 4x > 3x$$

$$x^2 - x < 0$$

$$x(x-1) < 0$$

$$0 < x < 1$$

$$x^2 - 7x > 0$$

$$x(x-7) > 0$$

$$x < 0 \vee x > 7$$

$$x < 0 \vee 0 < x < 1 \vee x > 7$$

N) $\forall x \in \mathbb{R}$

D) $x < 0 \vee 0 < x < 1 \vee x > 7$

	0		1		7	
+		+		+		+
+	 	+	 	-	 	+
+	 	+	 	⊖	 	+

$$1 < x < 7$$

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$\left[-\frac{1}{2}; \frac{1}{4}\right]$

$(2|x|)^2 - 4|x| + 1 = \overbrace{4x^2 + x + 1}^{>0 \text{ perché } \Delta < 0} - |x| - 1$

~~$4x^2 - 4|x| + 1 = 4x^2 + x + 1 - |x| - 1$~~

$|x|^2 = x^2$

$-3|x| = x - 1$

$3|x| = 1 - x$

1° Metodo

$\begin{cases} x \geq 0 \\ 3x = 1 - x \end{cases} \vee \begin{cases} x < 0 \\ -3x = 1 - x \end{cases}$

$\begin{cases} x \geq 0 \\ x = \frac{1}{4} \end{cases} \vee \begin{cases} x < 0 \\ x = -\frac{1}{2} \end{cases}$

$x = -\frac{1}{2} \vee x = \frac{1}{4}$

2° Metodo

$\begin{cases} 1 - x \geq 0 \\ 3x = \pm(1 - x) \end{cases}$

$\begin{cases} 1 - x \geq 0 \\ 3x = -(1 - x) \end{cases} \vee \begin{cases} 1 - x \geq 0 \\ 3x = 1 - x \end{cases}$

$\begin{cases} x \leq 1 \\ x = -\frac{1}{2} \end{cases} \vee \begin{cases} x \leq 1 \\ x = \frac{1}{4} \end{cases}$

$x = -\frac{1}{2} \vee x = \frac{1}{4}$

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

$$\begin{cases} y = \pm (2y - 1) \\ x + 2y - 1 = 0 \end{cases} \quad \vee \quad \begin{cases} y = -(2y - 1) \vee y = 2y - 1 \\ x + 2y - 1 = 0 \end{cases}$$

$$\begin{cases} y = -2y + 1 \\ x + 2y - 1 = 0 \end{cases} \quad \vee \quad \begin{cases} y = 2y - 1 \\ x + 2y - 1 = 0 \end{cases}$$

$$(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$$

$$\begin{cases} y = \frac{1}{3} \\ x + \frac{2}{3} - 1 = 0 \end{cases} \quad \vee \quad \begin{cases} y = 1 \\ x = -1 \end{cases}$$

$$\boxed{\begin{cases} x = \frac{1}{3} \\ y = \frac{1}{3} \end{cases} \quad \vee \quad \begin{cases} x = -1 \\ y = 1 \end{cases}}$$