16/3/2021

296 $(-2x^2+3x)(x^2-x-2)<0$

$$-x(2x-3)(x-2)(x+1)<0$$

$$x(2x-3)(x-2)(x+1)>0$$

e si può risolvere studiando ogni singolo fattore ...

In alternativa

$$\underbrace{(-2x^2+3x)}_{\boxed{1}}\underbrace{(x^2-x-2)}_{\boxed{2}}<0$$

$\boxed{1}$ $-2x^2+3x>0$ $\qquad 2x^2-3x<0 \qquad x(2x-3)<0$

$x_1=0 \qquad x_2=\frac{3}{2}$

$0<x<\frac{3}{2}$

$\boxed{2}$ $x^2-x-2>0 \qquad x_{1,2}=\frac{1\pm\sqrt{1+8}}{2}=\frac{1\pm3}{2}=\begin{cases}-1\\2\end{cases}$

$x<-1 \ \vee \ x>2$

$\boxed{1}$ $0<x<\frac{3}{2}$

$\boxed{2}$ $x<-1 \ \vee \ x>2$

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

$$\boxed{x<-1 \ \vee \ 0<x<\frac{3}{2} \ \vee \ x>2}$$

319 $(x-2)^2 - x^3 + 4x \geq 0$

$$x^2 \cancel{-4x} + 4 - x^3 \cancel{+4x} \geq 0$$

$$-x^3 + x^2 + 4 \geq 0$$

$$x^3 - x^2 - 4 \leq 0 \qquad \pm 1 \; \pm 2 \; \pm 4$$

	1	−1	0	−4
2		2	2	4
	1	1	2	//

$$\underbrace{(x-2)}_{\boxed{1}}\underbrace{(x^2+x+2)}_{\boxed{2}} \leq 0$$

$\boxed{1}$ $x-2>0 \quad x>2$

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

$\Delta = 1 - 4 \cdot 2 = -7 < 0$

		2	
1	−	0	+
2	+		+
	−	0	+

$$\boxed{x \leq 2}$$

OSSERVAZIONE

Allo stesso risultato sarei giunto semplificando

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

perché $\Delta<0$
e x^2+x+2 è
SEMPRE POSITIVO, quindi
non influisce sul segno del polinomio

(RAGIONAMENTO DA FARE IN FUTURO, NON ADESSO!!!)

320 $(5x-2)^3-25x^2+4>0$

$$(5x-2)^3-(25x^2-4)>0$$

$$(5x-2)^3-(5x-2)(5x+2)>0$$

$$(5x-2)\left[(5x-2)^2-(5x+2)\right]>0$$

$$(5x-2)(25x^2+4-20x-5x-2)>0$$

$$\underset{\boxed{1}}{(5x-2)}\,\underset{\boxed{2}}{(25x^2-25x+2)}>0$$

$\boxed{1}$ $5x-2>0 \qquad x>\frac{2}{5}$

$\boxed{2}$ $25x^2-25x+2>0 \qquad \Delta=(-25)^2-4\cdot 25\cdot 2=$

$$=625-200=425=5^2\cdot 17$$

425	5^2
17	17
1	

$$x_{1,2}=\frac{25\pm 5\sqrt{17}}{50}=$$

$$=\frac{\cancel{5}(5\pm\sqrt{17})}{\cancel{50}_{10}}=\frac{5\pm\sqrt{17}}{10}$$

$$x<\frac{5-\sqrt{17}}{10} \quad \vee \quad x>\frac{5+\sqrt{17}}{10}$$

		$\frac{5-\sqrt{17}}{10}$		$\frac{2}{5}$		$\frac{5+\sqrt{17}}{10}$	
1	$-$		$-$	0	$+$		$+$
2	$+$	0	$-$		$-$	0	$+$
	$-$	0	$+$	0	$-$	0	$+$

$$\boxed{\frac{5-\sqrt{17}}{10} < x < \frac{2}{5} \quad \vee \quad x > \frac{5+\sqrt{17}}{10}}$$