

DISEQUAZIONI IRRAZIONALI



M3007

$$\sqrt{x+1} - 2x = 4x - 7$$

$$\sqrt[n]{P(x)} = Q(x)$$

CASO DI n DISPARI

ES $\sqrt[3]{x-4} > 2x + 1$

$$(\sqrt[3]{x-4})^3 > (2x+1)^3$$

ELEVO A n

n PARI

CASO A)

$$\sqrt{2x-4} < x-1$$

SISTEMA DA
3

$$\left\{ \begin{array}{l} 2x-4 \geq 0 \\ x-1 > 0 \\ (\sqrt{2x-4})^2 < (x-1)^2 \end{array} \right.$$

A { $x \geq 2$

B { $x > 1$

C $2x-4 < x^2 + 1 - 2x$

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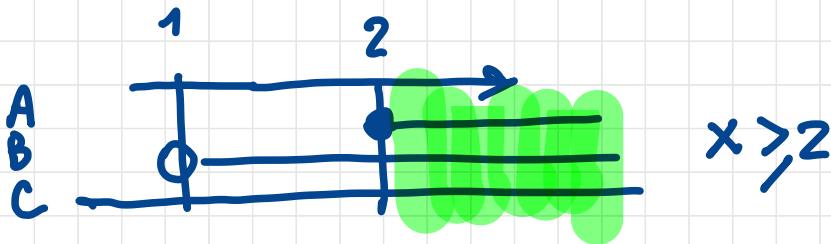
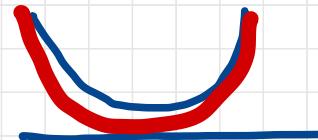
concluido la C)

$$x^2 - 4x + 5 > 0$$

$$x^2 - 4x + 5 = 0 \text{ Eq. ASS.}$$

$$a = 1 \quad b = -4 \quad c = +5 \quad \Delta = 16 - 4 \cdot 5 = -4$$

$$\left\{ \begin{array}{l} x > 2 \\ x > 1 \\ \forall x \in \mathbb{R} \end{array} \right.$$



IN GENERALE

$$\sqrt{A(x)} < B(x)$$

In sintesi, la disequazione $\sqrt{A(x)} < B(x)$ è equivalente al sistema:

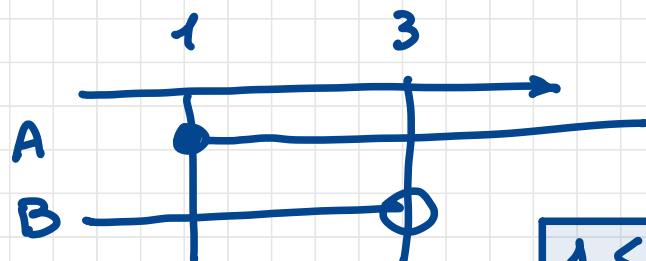
$$\begin{cases} A(x) \geq 0 \\ B(x) > 0 \\ A(x) < [B(x)]^2 \end{cases}$$

CASO B) $\sqrt{x-1} > x-3$

$$\text{I} \quad \begin{cases} x-1 \geq 0 \\ x-3 < 0 \end{cases}$$

$$\text{II} \quad \begin{cases} x-3 \geq 0 \\ (\sqrt{x-1})^2 > (x-3)^2 \end{cases}$$

$$\begin{matrix} \text{A} \\ \text{B} \end{matrix} \quad \begin{cases} x \geq 1 \\ x < 3 \end{cases}$$



$$1 \leq x < 3$$

I

$$\text{II} \quad \left\{ \begin{array}{l} x - 3 \geq 0 \\ x - 1 > (x - 3)^2 \end{array} \right.$$

$$= A \quad \left\{ \begin{array}{l} x \geq 3 \\ x - 1 > x^2 + 9 - 6x \end{array} \right.$$

continuo la B)

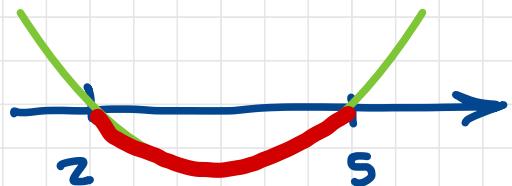
$$x^2 - 7x + 10 < 0$$

$$x^2 - 7x + 10 = 0 \quad \Sigma. \text{ Ass}$$

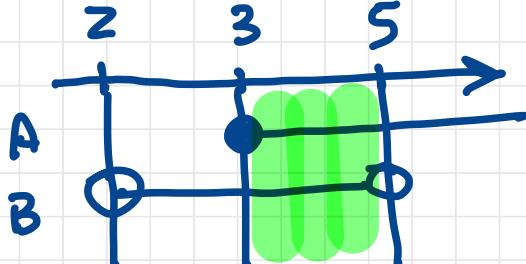
$$a = 1 \quad b = -7 \quad c = +10 \quad \Delta = 49 - 40 = 9$$

$$x_1 = \frac{7+3}{2} = 5$$

$$x_2 = \frac{7-3}{2} = 2$$



$$\text{II} \quad \left\{ \begin{array}{l} x \geq 3 \\ 2 < x < 5 \end{array} \right.$$

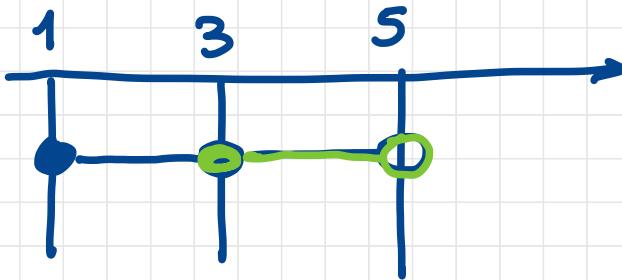


$$2 < x < 5$$

$$3 \leq x < 5$$

II

I U II



$$1 \leq x < 5$$

IN GENERALE

$$\sqrt{A(x)} > B(x)$$

In sintesi, l'insieme delle soluzioni della disequazione $\sqrt{A(x)} > B(x)$ è l'unione delle soluzioni dei due sistemi:

$$\begin{cases} A(x) \geq 0 \\ B(x) < 0 \end{cases} \quad \vee \quad \begin{cases} B(x) \geq 0 \\ A(x) > [B(x)]^2 \end{cases}$$