

SOLUCIÓN RETRASO. ECUACIONES.

1. Resuelve

a) $3x^4 - 12x^2 = 0$

$x^2 = t \quad 3t^2 - 12t = 0$

$3t(t-4) = 0$

$t_1 = 0 \rightarrow \boxed{x_1 = 0}$

$t_2 = 4 \rightarrow \boxed{x_2 = \pm 2}$

c) $x^4 - 10x^2 + 9 = 0$

$x^2 = t \quad t^2 - 10t + 9 = 0$

$t = \frac{10 \pm \sqrt{100 - 36}}{2} = \frac{10 \pm 8}{2} = \begin{matrix} 9 \\ 1 \end{matrix}$

$\boxed{x_1 = \pm 3}$
 $\boxed{x_2 = \pm 1}$

b) $x^4 - 9x^2 + 2 = 0$

$x^2 = t \quad t^2 - 9t + 2 = 0$

$t = \frac{9 \pm \sqrt{81 - 8}}{2} = \frac{9 \pm \sqrt{73}}{2} = \begin{matrix} \frac{9 + \sqrt{73}}{2} \\ \frac{9 - \sqrt{73}}{2} \end{matrix}$

$x_1 = \pm \sqrt{\frac{9 + \sqrt{73}}{2}}$

$x_2 = \pm \sqrt{\frac{9 - \sqrt{73}}{2}}$

d) $x^4 + 5x^2 + 4 = 0$

$x^2 = t \quad t^2 + 5t + 4 = 0$

$t = \frac{-5 \pm \sqrt{25 - 16}}{2} = \frac{-5 \pm 3}{2} = \begin{matrix} -1 \\ -4 \end{matrix}$

$x_1 = \sqrt{-1}$ no tiene solución

$x_2 = \sqrt{-4}$ no tiene solución.

2. Resuelve:

a) $(\sqrt{4x+5})^2 = (x+2)^2$

$4x+5 = x^2 + 4x + 4$

$x^2 - 1 = 0$

$x^2 = 1$

$x = \pm 1$

Comprobación:

$x = 1$

$\sqrt{4+5} = 3$

$\sqrt{9} = 3$

$3 = 3 \checkmark$

$x = -1$

$\sqrt{1} = -1 + 2$

$1 = 1 \checkmark$

b) $x - \sqrt{2x-3} = 1$

$(x-1)^2 = (\sqrt{2x-3})^2$

$x^2 - 2x + 1 = 2x - 3$

$x^2 - 4x + 4 = 0$

$x = \frac{4 \pm \sqrt{16 - 16}}{2} = \frac{4 \pm 0}{2} = 2$ solución doble

Comprobación:

$2 - \sqrt{4-3} = 1$

$2 - 1 = 1$

$1 = 1 \checkmark$

c) $\sqrt{x} + 2 = x$

$(\sqrt{x})^2 = (x-2)^2$

$x = x^2 - 4x + 4$

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

$x = \frac{5 \pm \sqrt{25 - 16}}{2} = \frac{5 \pm 3}{2} = \begin{matrix} 4 \checkmark \\ 1 \end{matrix}$

Comprobación:

$x_1 = 4$

$\sqrt{4} + 2 = 4$

$2 + 2 = 4$

$4 = 4 \checkmark$

$x_2 = 1$

$1 + 2 = 1$

$3 \neq 1 \times$

d) $\sqrt{x^2+7} + 2 = 2x$

$(\sqrt{x^2+7})^2 = (2x-2)^2$

$x^2 + 7 = 4x^2 - 8x + 4$

$3x^2 - 8x - 3 = 0$

$x = \frac{8 \pm \sqrt{64 + 36}}{6} = \frac{8 \pm 10}{6} = \begin{matrix} \frac{18}{6} = 3 \checkmark \\ \frac{-2}{6} = -1/3 \end{matrix}$

Comprobación:

$x_1 = 3$

$\sqrt{9+7} + 2 = 6$

$4 + 2 = 6$

$6 = 6 \checkmark$

$x_2 = -1/3$

$\sqrt{\frac{1}{9} + 7} + 2 = -\frac{2}{3}$

$\sqrt{\frac{64}{9}} + 2 = -\frac{2}{3}$

$\frac{8}{3} + 2 = -\frac{2}{3}$

$\frac{14}{3} \neq -\frac{2}{3} \times$

3. Resuelve:

$$a) \frac{(x-3)^2}{4} - \frac{(2x-1)^2}{16} = \frac{35}{16}$$

$$4(x-3)^2 - (2x-1)^2 = 35$$

$$4(x^2 - 6x + 9) - (4x^2 - 4x + 1) = 35$$

$$4x^2 - 24x + 36 - 4x^2 + 4x - 1 = 35$$

$$-20x = 0$$

$$\boxed{x=0}$$

$$b) x + \frac{3x+1}{2} - \frac{x-2}{3} = x^2 - 2$$

$$6x + 3(3x+1) - 2(x-2) = 6x^2 - 12$$

$$6x + 9x + 3 - 2x + 4 = 6x^2 - 12$$

$$6x^2 - 13x - 19 = 0$$

$$x = \frac{13 \pm \sqrt{169 + 456}}{12} = \frac{13 \pm 25}{12} = \begin{cases} \frac{19}{6} \\ -1 \end{cases}$$