

PÁG. 150

4.

a) $x^2 - 3x - 5 = 2x + 9$

REDUCIR: $x^2 - 3x - 2x - 5 - 9 = 0$

$$x^2 - 5x - 14 = 0$$

RESOLVER ECUACIÓN 2º GRADO COMPLETA:

$a = 1$

$b = -5$

$c = -14$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4 \cdot 1 \cdot (-14)}}{2 \cdot 1} =$$

$$= \frac{5 \pm \sqrt{25 + 56}}{2} = \frac{5 \pm \sqrt{81}}{2} =$$

$$= \frac{5 \pm 9}{2} = \begin{cases} \frac{5+9}{2} = \frac{14}{2} = 7 = x_1 \\ \frac{5-9}{2} = \frac{-4}{2} = -2 = x_2 \end{cases}$$

SOLUCIONES: 7 y -2.

c) $\frac{2x^2}{1} + \frac{x}{4} = \frac{x^2}{1} + \frac{4x}{5} + \frac{1}{5}$

$$\frac{40x^2}{20} + \frac{5x}{20} = \frac{20x^2}{20} + \frac{16x}{20} + \frac{4}{20}$$

DENOMINADORES:

m.c.m. (1, 4, 5) = 20

Multipliendo los
2 miembros de la
ecuación por 20:

$$40x^2 + 5x = 20x^2 + 16x + 4$$

REDUCIR:

$$40x^2 - 20x^2 + 5x - 16x - 4 = 0$$

$$20x^2 - 11x - 4 = 0$$

RESOLVER:

$a = 20; b = -11; c = -4$

$$x = \frac{-(-11) \pm \sqrt{(-11)^2 - 4 \cdot 20 \cdot (-4)}}{2 \cdot 20} = \frac{11 \pm \sqrt{121 + 320}}{40} = \frac{11 \pm \sqrt{441}}{40} = \frac{11 \pm 21}{40}$$

$$x_1 = \frac{11+21}{40} = \frac{32}{40} = \frac{4}{5}$$

$$x_2 = \frac{11-21}{40} = \frac{-10}{40} = -\frac{1}{4}$$

Soluciones: $\frac{4}{5}, -\frac{1}{4}$

4)

d) $x \cdot (x+1) - \frac{1}{2} = \frac{x-4}{6}$

PARÉNT: $x^2 + x - \frac{1}{2} = \frac{x-4}{6}$

DENOMINADORES: $\frac{6x^2}{6} + \frac{6x}{6} - \frac{3}{6} = \frac{x}{6} - \frac{4}{6}$

mcm (4, 2, 6) = 6

Multiplica los dos miembros de la ecuación por 6

6x² + 6x - 3 = x - 4

REDUCIR:

6x² + 6x - x - 3 + 4 = 0
6x² + 5x + 1 = 0

RESOLVER ECUACIÓN 2º GRADO:

a = +6
b = +5
c = +1

$$x = \frac{-b \pm \sqrt{b^2 - 4 \cdot a \cdot c}}{2 \cdot a}$$

$x = \frac{-5 \pm \sqrt{5^2 - 4 \cdot 6 \cdot 1}}{2 \cdot 6} = \frac{-5 \pm \sqrt{25 - 24}}{2 \cdot 6} =$

$= \frac{-5 \pm \sqrt{1}}{12} = \frac{-5 \pm 1}{12}$
 $\rightarrow x_1 = \frac{-5+1}{12} = -\frac{4}{12} = -\frac{1}{3}$
 $\rightarrow x_2 = \frac{-5-1}{12} = -\frac{6}{12} = -\frac{1}{2}$

Soluciones: $-\frac{1}{3}$ y $-\frac{1}{2}$

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b) $6x^2 - 5 \cdot (x-1) = x \cdot (x+1) + 4$

1° PARÉNTESIS:

$$6x^2 - 5x + 5 = x^2 + x + 4$$

2° REDUCIR:

$$6x^2 - x^2 - 5x - x + 5 - 4 = 0$$

$$5x^2 - 6x + 1 = 0$$

3° RESOLVER ec. 2° GRADO COMPLETA:

$$x = \frac{-b \pm \sqrt{b^2 - 4 \cdot a \cdot c}}{2 \cdot a}$$

$$a = 5$$

$$b = -6$$

$$c = 1$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4 \cdot 5 \cdot 1}}{2 \cdot 5}$$

$$= \frac{6 \pm \sqrt{36 - 20}}{10}$$

$$\frac{6+1}{10} = 1 \leftarrow x_1$$

$$= \frac{6 \pm \sqrt{16}}{10} = \frac{6 \pm 4}{10} = \frac{6-4}{10} = \frac{2}{10} = \frac{1}{5} \leftarrow x_2$$

SOLUTIONES: $x_1 = 1$ y $x_2 = \frac{1}{5}$

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$$\frac{2x+2}{3} + \frac{x^2-x}{5} = \frac{3x+1}{10}$$

quedando!

$$\frac{2x}{3} + \frac{2}{3} + \frac{x^2}{5} - \frac{x}{5} = \frac{3x}{10} + \frac{1}{10}$$

$$\text{mcm } (3, 5, 10) = 30$$

denominadores:

$$\frac{20x}{30} + \frac{20}{30} + \frac{6x^2}{30} - \frac{6x}{30} = \frac{9x}{30} + \frac{21}{30}$$

Multiplique toda la ecuación por 30.

$$20x + 20 + 6x^2 - 6x = 9x + 21$$

REDUCIR:

$$6x^2 + 20x - 6x - 9x + 20 - 21 = 0$$

$$6x^2 + 5x - 1 = 0 \quad \left| \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \right|$$

RESOLVER:

$$6x^2 + 5x - 1 = 0$$

quedando!

$$a=6$$

$$b=5$$

$$c=-1$$

quedando!

$$x = \frac{-5 \pm \sqrt{5^2 - 4 \cdot 6 \cdot (-1)}}{2 \cdot 6} = \frac{-5 \pm \sqrt{25 + 24}}{12}$$

$$= \frac{-5 \pm \sqrt{49}}{12} = \frac{-5 \pm 7}{12}$$

$$\frac{-5+7}{12} = \frac{2}{12} = \frac{1}{6} \leftarrow x_1$$

$$\frac{-5-7}{12} = \frac{-12}{12} = -1 \leftarrow x_2$$

SOLUTIONS: $x_1 = \frac{1}{6}, x_2 = -1$