

## Página 65.

7) a)  $5x^2 - 5x - 30 + 2(x^2 - 4x + 3) = 7(x^2 + x - 2)$

$$5x^2 - 5x - 30 + 2x^2 - 8x + 6 = 7x^2 + 7x - 14 \implies -5x - 30 - 8x + 6 = 7x - 14$$

$$-5x - 8x - 7x = -14 + 30 - 6 \implies -20x = 10 \implies x = -\frac{1}{2}$$

b)  $9x^2 - 4 - 2 = 5x + 4 + 9x^2 \implies 5x + 4 = -4 - 2 \implies 5x = -4 - 2 - 4 = -10$

$$x = \frac{-10}{5} \implies x = -2$$

c)  $\frac{2(2x-2)^2}{10} + \frac{15x}{10} = \frac{4x(2x+1)}{10} \implies 2(4x^2 - 8x + 4) + 15x = 8x^2 + 4x$

$$8x^2 - 16x + 8 + 15x = 8x^2 + 4x \implies -16x + 15x - 4x = -8 \implies -5x = -8 \implies x = \frac{8}{5}$$

c)  $3 - (x^2 - 3x + 2) = x(1 - x) \implies 3 - x^2 + 3x - 2 = x - x^2 \implies 3x - x = -3 + 2$

$$2x = -1 \implies x = -\frac{1}{2}$$

8) a)  $5a + 8 - 3 = -a + 1 + 4 \implies 5a + a = 1 + 4 - 8 + 3 \implies 6a = 0 \implies a = 0$

b)  $5a - 3 = -a + 1 \implies 5a + a = 1 + 3 \implies 6a = 4 \implies a = \frac{4}{6} = \frac{2}{3}$

c)  $5a + 32 - 3 = -a + 1 + 16 \implies 6a = 17 - 29 \implies 6a = -12 \implies a = -2$

d)  $5a - 16 - 3 = -a + 1 - 8 \implies 6a = -7 + 19 \implies 6a = 12 \implies a = 2$

e)  $5a + 4 - 3 = -a + 1 + 2 \implies 6a = 3 - 1 \implies 6a = 2 \implies a = \frac{2}{6} = \frac{1}{3}$

f)  $5a - 40 - 3 = -a + 1 - 20 \implies 6a = -19 + 43 \implies 6a = 24 \implies a = 4$

9) a)  $-2x = 8 \implies x = -\frac{8}{2} \implies x = -4$

b)  $3x - 6 - 5x + 5 = 9 \implies 3x - 5x = 9 + 6 - 5 \implies -2x = 10 \implies x = -5$

c)  $-3x - 2 = -5 \implies -3x = -5 + 2 \implies -3x = -3 \implies x = 1$

10) a)  $-1 + 2 = 1 \implies x + 2 = 1$

b)  $\frac{1}{6} + 3 = \frac{1+18}{6} = \frac{19}{6} \implies 3x + \frac{19}{6} = \frac{1}{6}$

c)  $\frac{1}{6} + \frac{4}{3} = \frac{1+8}{6} = \frac{9}{6} = \frac{3}{2} \implies \frac{4x}{3} + \frac{3}{2} = \frac{1}{6}$

- d)  $-5 + 2 = -3 \implies 5x + 2 = -3$   
 e)  $0 - 20 = -20 \implies 20x + 20 = 0$   
 f)  $2 + \frac{5}{7} = \frac{14+5}{7} = \frac{19}{7} \implies \frac{5}{7}x + \frac{19}{7} = 2$

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4) a) Si fuese  $3x$ :  $3x + 8 = 3x \implies 0x = 8$  no tendría solución. La respuesta es cualquier valor distinto de  $3x$ . Por ejemplo:  $3x + 8 = 2x \implies 3x - 2x = -8 \implies x = -8$

b) Valor  $\neq \frac{1}{2}x$ . Por ejemplo:  $\frac{1}{2}x + \frac{2}{3} = 0$

c) Valor  $\neq 5x - x = 4x$ . Por ejemplo:  $x + 2x = 5x - 1$

d) Valor  $\neq 7x$ . Por ejemplo:  $8x + 7 = 7x - 6$

e) Valor  $\neq -\frac{x}{3}$ . Por ejemplo:  $\frac{x+2}{3} + 1 = 5$

f) Valor  $\neq \frac{1}{3}$ . Por ejemplo:  $x + 5 = \frac{x-1}{3}$

5) a) Si fuese  $7$ :  $7x - 2 = 7x \implies 0x = 2$  no tendría solución.

b) Valor = 4:  $\frac{4x-6}{2} - \frac{4x+5}{2} = 0 \implies \frac{4x}{2} - \frac{6}{2} - \frac{4x}{2} - \frac{5}{2} = 0 \implies \frac{4x}{2} - \frac{4x}{2} = 3 + \frac{5}{2} \implies 0x = \frac{11}{2}$

c) Valor  $\neq 3$ , pues  $x + 3 = 3 + x \implies 0x = 0$ , que tendría infinitas soluciones.

Por ejemplo:  $x + 3 = 2 + x \implies x - x = 2 - 3 \implies 0x = -1$ , que no tiene solución

d)  $\frac{7x+1}{3} - \frac{7x}{3} = \frac{1}{3}$ , cualquier valor como término independiente.

Por ejemplo:  $\frac{7x+1}{3} = \frac{14x+1}{6} \implies \frac{7x}{3} - \frac{7x}{3} = \frac{1}{6} - \frac{1}{3} \implies 0x = \frac{1-2}{6} \implies 0x = -\frac{1}{6}$

d)  $4x - 4x = 0$ , cualquier valor como término independiente.

Por ejemplo:  $4x - 5 = 4x \implies 4x - 4x = 5 \implies 0x = 5$

e) Valor =  $\frac{1}{4}$ :  $\frac{x}{4} + \frac{4}{5} = \frac{1}{4}x - \frac{3}{10} \implies \frac{x}{4} - \frac{x}{4} = -\frac{3}{10} - \frac{4}{5} \implies 0x = \frac{-3-8}{10} \implies 0x = -\frac{11}{10}$

6) a) Valor = 6:  $6x + 2 = 2 + 6x \implies 6x - 6x = 2 - 2 \implies 0x = 0$ .

b) Valor1 = -3 y valor2 = 5:  $-3x + 5 = -3x + 5 \implies -3x + 3x = 5 - 5 \implies 0x = 0$ .

## Ecuaciones

$$c) \text{ Valor} = \frac{x}{4} + \frac{x}{2} - \frac{3x}{4} - \frac{2}{4} + \frac{6}{2} = \frac{3x}{4} - \frac{3x}{4} + \frac{5}{2} = \frac{5}{2} \implies \frac{x-2}{4} + \frac{x+6}{2} = \frac{3x}{4} + \frac{5}{2} \implies$$

$$\frac{x}{4} - \frac{2}{4} + \frac{x}{2} + 3 = \frac{3x}{4} + \frac{5}{2} \implies \frac{x}{4} + \frac{x}{2} - \frac{3x}{4} = \frac{5}{2} + \frac{1}{2} - 3 \implies 0x = 0$$

$$d) \text{ Valor1} = 6 \text{ y valor2} = x: 6 + x = x + 6 \implies x - x = 6 - 6 \implies 0x = 0$$

$$e) \text{ Valor} = -2: -2(x+1) = x - 3x - 2 \implies -2x - 2 = -2x - 2 \implies 0x = 0$$

$$f) \text{ Valor} = \frac{2}{3}: \frac{9x-2}{3} = \frac{7x-2}{3} + \frac{2}{3}x \implies \frac{9x}{3} - \frac{7x}{3} - \frac{2}{3}x = -\frac{2}{3} + \frac{2}{3} \implies 0x = 0$$

7) a) Para cualquier valor de  $x$ .

b) Para  $x = 0$ .

c) Para ningún valor de  $x$ .

8) No, la solución es  $x = 0$ .

9) a) Existen múltiples posibilidades, siempre que  $a$  sea distinto de cero.

b) Que  $a = 0$  y  $b$  sea distinto de cero.

c) Que  $a$  y  $b$  sean cero.

10) a) Verdadera.

b) Falsa.

c) Falsa.

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$$3) h) 7x^2 - 13x = 0 \implies x(7x - 13) = 0. \text{ Soluciones: } \begin{cases} x = 0 \\ 7x - 13 = 0 \implies x = \frac{13}{7} \end{cases}$$

$$i) 8x^2 = 0 \implies x = 0$$

$$j) 4x^2 - 8 = 0 \implies 4x^2 = 8 \implies x^2 = 2 \implies x = \pm\sqrt{2}$$

$$k) 2x^2 = 5 \implies x^2 = \frac{5}{2} \implies x = \pm\sqrt{\frac{5}{2}}$$

$$l) x(4x - 1) = 0 \begin{cases} x = 0 \\ 4x - 1 = 0 \implies x = \frac{1}{4} \end{cases}$$

$$m) x^2 = 5 \implies x = \pm\sqrt{5}$$

n)  $x^2 = 9 \implies x = \pm 3$

**Página 71.**

4) a) 
$$\left. \begin{array}{l} a = x \\ 2ab = 6x \end{array} \right\} \implies 2xb = 6x \implies b = \frac{6x}{2x} = 3 \quad (x+3)^2 = x^2 + 6x + 9$$

$$x^2 + 6x - 7 = 0 \implies x^2 + 6x - 7 + 9 = 0 + 9 \implies x^2 + 6x + 9 = 9 + 7$$

$$(x+3)^2 = 16 \implies (x+3) = \pm\sqrt{16} \implies x+3 = \pm 4 \implies \begin{cases} x+3 = 4 \implies x = 1 \\ x+3 = -4 \implies x = -7 \end{cases}$$

b) 
$$\left. \begin{array}{l} 2xb = -8x \implies b = -4 \\ (x-4)^2 = x^2 - 8x + 16 \end{array} \right| \begin{array}{l} x^2 - 8x = 9 \implies x^2 - 8x + 16 = 9 + 16 \\ (x-4)^2 = 25 \implies (x-4) = \pm 5 \implies \begin{cases} x-4 = 5 \implies x = 9 \\ x-4 = -5 \implies x = -1 \end{cases} \end{array}$$

c) 
$$\left. \begin{array}{l} 2b = 12 \implies b = 6 \\ (x+6)^2 = x^2 + 12x + 36 \end{array} \right| \begin{array}{l} x^2 + 12x = 64 \implies x^2 + 12x + 36 = 64 + 36 \\ (x+6)^2 = 100 \implies x+6 = \pm 10 \implies \begin{cases} x+6 = 10 \implies x = 4 \\ x+6 = -10 \implies x = -16 \end{cases} \end{array}$$

d) 
$$\left. \begin{array}{l} 2b = -4 \implies b = -2 \\ (x-2)^2 = x^2 - 4x + 4 \end{array} \right| \begin{array}{l} x^2 - 4x = 5 \implies x^2 - 4x + 4 = 5 + 4 \\ (x-2)^2 = 9 \implies (x-2) = \pm 3 \implies \begin{cases} x-2 = 3 \implies x = 5 \\ x-2 = -3 \implies x = -1 \end{cases} \end{array}$$