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①

$$a) (2x-3)(3x-2) + 2x+3 = 0$$

$$6x^2 - 4x - 9x + 6 + 2x + 3 = 0$$

$$6x^2 - 11x + 9 = 0$$

$$x = \frac{11 \pm \sqrt{121 - 216}}{12} = \frac{11 \pm \sqrt{-95}}{12} \not\rightarrow \text{No tiene solución.}$$

$$b) 3(x-1)^2 + 5x = 5$$

$$3(x^2 + 1 - 2x) + 5x = 5$$

$$3x^2 + 3 - 6x + 5x = 5$$

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

$$\left[ x = \frac{1 \pm \sqrt{1+24}}{6} = \frac{1 \pm 5}{6} \right. \\ \left. \begin{array}{l} \frac{1+5}{6} = 1 \\ \frac{1-5}{6} = -\frac{4}{6} = -\frac{2}{3} \end{array} \right]$$

$$c) (x+1)(x+2) = 2(x+2)$$

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

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

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

$$\left[ x = \frac{-1 \pm \sqrt{1+8}}{2} = \frac{-1 \pm 3}{2} \right. \\ \left. \begin{array}{l} \frac{-1+3}{2} = 1 \\ \frac{-1-3}{2} = -2 \end{array} \right]$$

$$d) 1 + (1-x)(2x+1) = x^2$$

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

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

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

$$\cdot (-1) \rightarrow 3x^2 - x - 2 = 0$$

$$\left[ x = \frac{1 \pm \sqrt{1+24}}{6} = \frac{1 \pm 5}{6} \right. \begin{array}{l} \left. \frac{1+5}{6} = 1 \right] \\ \left. \frac{1-5}{6} = -\frac{4}{6} = -\frac{2}{3} \right] \end{array}$$

$$e) 3x^2 - 2(x+5) = (x+3)^2 - 19$$

$$3x^2 - 2x - 10 = x^2 + 9 + 6x - 19$$

$$3x^2 - 2x - 10 - x^2 - 9 - 6x + 19 = 0$$

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

$$2x(x-4) = 0 \quad \begin{array}{l} \boxed{x=0} \\ \boxed{x=4} \end{array}$$

$$f) (3x+4)(5x-7) = \underbrace{(2x+7)^2}_{\text{I.N.}} + 53 \quad (3)$$

$$15x^2 - 21x + 20x - 28 = 4x^2 + 49 + 28x + 53$$

$$\underbrace{15x^2}_{\sim} - \underbrace{21x}_{\sim} + \underbrace{20x}_{\sim} - 28 - \underbrace{4x^2}_{\sim} - 49 - \underbrace{28x}_{\sim} - 53 = 0$$

$$11x^2 - 29x - 130 = 0$$

$$\left[ x = \frac{29 \pm \sqrt{841 + 5720}}{22} = \frac{29 \pm 81}{22} \right. \left. \begin{array}{l} \frac{29+81}{22} = \frac{110}{22} = 5 \\ \frac{29-81}{22} = \frac{-52}{22} = \frac{-26}{11} \end{array} \right]$$

$$g) (2x+4)(x-1) + \underbrace{(3x+5)^2}_{\text{I.N.}} = 3 \underbrace{(2x+5)^2}_{\text{I.N.}} + x$$

$$2x^2 - 2x + 4x - 4 + 9x^2 + 25 + 30x = 3(4x^2 + 25 + 20x) + x$$

$$2x^2 - 2x + 4x - 4 + 9x^2 + 25 + 30x = 12x^2 + 75 + 60x + x$$

$$\underbrace{2x^2}_{\sim} - \underbrace{2x}_{\sim} + \underbrace{4x}_{\sim} - 4 + \underbrace{9x^2}_{\sim} + 25 + \underbrace{30x}_{\sim} - \underbrace{12x^2}_{\sim} - 75 - \underbrace{60x}_{\sim} - x = 0$$

$$-x^2 - 29x - 54 = 0$$

$$\cdot (-1) \rightarrow x^2 + 29x + 54 = 0$$

$$\left[ x = \frac{-29 \pm \sqrt{841 - 216}}{2} = \frac{-29 \pm \sqrt{625}}{2} = \frac{-29 \pm 25}{2} \right]$$

$$\left[ \frac{-29+25}{2} = \frac{-4}{2} = -2 \right]$$

$$\left[ \frac{-29-25}{2} = \frac{-54}{2} = -27 \right]$$

$$h) (x-2)(4x+2) + \underbrace{(3-3x)^2}_{\text{IN}} = 4 \underbrace{(5x+1)^2}_{\text{IN}} - \underbrace{(x-1)}_{\text{IN}} \quad (4)$$

$$4x^2 + 2x - 8x - 4 + 9 + 9x^2 - 18x = 4(25x^2 + 1 + 10x) - x + 1$$

$$4x^2 + 2x - 8x - 4 + 9 + 9x^2 - 18x = 100x^2 + 4 + 40x - x + 1$$

$$\underbrace{4x^2 + 2x - 8x - 4 + 9 + 9x^2 - 18x}_{\text{M M}} - \underbrace{100x^2 + 4 + 40x - x + 1}_{\text{M M}} = 0$$

$$-87x^2 - 63x = 0$$

$$x(-87x - 63) = 0 \quad \left\{ \begin{array}{l} \boxed{x=0} \\ -87x - 63 = 0 \end{array} \right.$$

$$-87x = 63$$

$$\boxed{x = -\frac{63}{87} = -\frac{21}{29}}$$

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$$2) \quad 3x(x+1) - \frac{(x-2)^2}{2} = (x+1)(x-1) + 15$$

$$\frac{6x(x+1)}{2} - \frac{(x-2)^2}{2} = \frac{2(x+1)(x-1)}{2} + \frac{30}{2}$$

$$6x^2 + 6x - (x^2 + 4 - 4x) = 2 \cdot (x^2 - 1) + 30$$

$$6x^2 + 6x - x^2 - 4 + 4x = 2x^2 - 2 + 30$$

$$\underbrace{6x^2 + 6x - x^2 - 4 + 4x - 2x^2 + 2 - 30}_{\sim \quad \sim \quad \sim \quad \sim \quad \sim \quad \sim} = 0$$

$$3x^2 + 10x - 32 = 0$$

$$\left[ x = \frac{-10 \pm \sqrt{100 + 384}}{6} = \frac{-10 \pm 22}{6} \right. \begin{cases} \frac{-10 + 22}{6} = \frac{12}{6} = \boxed{2} \\ \frac{-10 - 22}{6} = \frac{-32}{6} = \frac{-16}{3} \end{cases}$$

$$*c) \quad \frac{3x}{2} - \frac{1}{x} = \frac{3}{2}$$

$$\text{mcm}(2, x) = 2x$$

$$\frac{3x \cdot x}{2x} - \frac{1 \cdot 2}{2x} = \frac{3 \cdot x}{2x}$$

$$3x^2 - 2 = 3x$$

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

$$x = \frac{3 \pm \sqrt{9 + 24}}{6} = \frac{3 \pm \sqrt{33}}{6} \begin{cases} \frac{3 + \sqrt{33}}{6} \\ \frac{3 - \sqrt{33}}{6} \end{cases}$$

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$$b) \frac{(x+1)^2}{2} - \frac{3(x-1)}{4} + \frac{3x(x+1)}{2} = \frac{3}{2}$$

$$\frac{2(x+1)^2}{4} - \frac{3(x-1)}{4} + \frac{2 \cdot 3x(x+1)}{4} = \frac{2 \cdot 3}{4}$$

$$2 \cdot \underbrace{(x+1)^2}_{\text{IN}} - 3(x-1) + 6x(x+1) = 6$$

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

$$\underbrace{2x^2+2+4x}_{\text{M}} - \underbrace{3x+3}_{\text{M}} + \underbrace{6x^2+6x}_{\text{M}} - 6 = 0$$

$$8x^2 + 7x - 1 = 0$$

$$\left[ x = \frac{-7 \pm \sqrt{49+32}}{16} = \frac{-7 \pm \sqrt{81}}{16} = \frac{-7 \pm 9}{16} \right. \left. \begin{array}{l} \frac{-7+9}{16} = \frac{2}{16} = \frac{1}{8} \\ \frac{-7-9}{16} = \frac{-16}{16} = -1 \end{array} \right]$$

$$*d) \frac{x}{3} - 1 + \frac{1}{x} = 1 - \frac{2}{3x}$$

$$\text{mcm}(3, x, 3x) = 3x$$

$$\frac{x \cdot x}{3x} - \frac{3x}{3x} + \frac{1 \cdot 3}{3x} = \frac{3x}{3x} - \frac{2}{3x}$$

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

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

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

$$\left[ x = \frac{6 \pm \sqrt{36-20}}{2} = \frac{6 \pm \sqrt{16}}{2} = \frac{6 \pm 4}{2} \right. \left. \begin{array}{l} \frac{6+4}{2} = 5 \\ \frac{6-4}{2} = 1 \end{array} \right]$$