

$$1. \quad a.) \quad 2 - \frac{x-1}{2} = \frac{2-x}{3}$$

$$\frac{12}{6} - \frac{3(x-1)}{6} = \frac{2(2-x)}{6} \quad | \cdot 6$$

$$12 - 3(x-1) = 2(2-x)$$

$$12 - 3x + 3 = 4 - 2x$$

$$-3x + 15 = -2x + 4 \quad | +3x$$

$$15 = x + 4 \quad | -4$$

$$\underline{\underline{11 = x \quad |}}$$

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$$b.) \quad \frac{x}{2} - \frac{2x}{3} + \frac{x-1}{4} = 0$$

$$\frac{6x}{12} - \frac{8x}{12} + \frac{3(x-1)}{12} = 0 \quad | \cdot 12$$

$$6x - 8x + 3(x-1) = 0$$

$$6x - 8x + 3x - 3$$

$$x - 3 = 0 \quad | +3$$

$$\underline{\underline{x = 3 \quad |}}$$

$$2. \quad \frac{5x}{2} - 3 < \frac{8}{5} - x$$

$$\frac{25x}{10} - \frac{30}{10} < \frac{16}{10} - \frac{10x}{10} \quad | \cdot 10$$

$$25x - 30 < 16 - 10x \quad | +10x$$

$$35x - 30 < 16 \quad | +30$$

$$35x < 46 \quad | :35$$

$$\underline{\underline{x < \frac{46}{35} \quad | \frac{1}{2}}}$$

$$\frac{8}{5} - x < \frac{x-1}{3} + 6$$

$$\frac{24}{15} - \frac{15x}{15} < \frac{5(x-1)}{15} + \frac{90}{15} \quad | \cdot 15$$

$$24 - 15x < 5x - 5 + 90 \quad | +15x$$

$$24 < 20x + 85 \quad | -85$$

$$-61 < 20x \quad | :20$$

$$\underline{\underline{-\frac{61}{20} < x \quad | \frac{1}{2}}}$$

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$$G = \mathbb{N} \quad : \quad \mathbb{L} = \underline{\underline{\{1\} \quad | \frac{1}{2}}}$$

$$G = \mathbb{N}_0 \quad : \quad \mathbb{L} = \underline{\underline{\{0, 1\} \quad | \frac{1}{2}}}$$

$$G = \mathbb{Z} \quad : \quad \mathbb{L} = \underline{\underline{\{-3, -2, -1, 0, 1\} \quad | \frac{1}{2}}}$$

$$G = \mathbb{Q} \quad : \quad \mathbb{L} = \underline{\underline{\{x \mid -\frac{61}{20} < x < \frac{46}{35}\} \quad | \frac{1}{2}}}$$

$$\underline{3.} \quad \frac{1}{x} - \left( \frac{2}{3x} - \frac{1}{x-1} \right) > 0 \quad x \neq 0; 1$$

$$\frac{3(x-1)}{3x(x-1)} - \left( \frac{2(x-1)}{3x(x-1)} - \frac{3x}{3x(x-1)} \right) > 0 \quad | \cdot 3x(x-1)$$

$$3(x-1) - (2(x-1) - 3x) > 0$$

$$3x - 3 - (2x - 2 - 3x) > 0$$

$$3x - 3 - 2x + 2 + 3x > 0$$

$$4x - 1 > 0 \quad | + 1$$

$$4x > 1 \quad | : 4$$

$$x > \frac{1}{4} \quad \text{N/4}$$

$$\mathbb{L} = \underline{\underline{\{ 2, 3, 4, 5, \dots \}}}$$

$$\underline{4.} \quad \frac{4x}{x^2-4} - \frac{2}{x-2} = \frac{2}{x+2} \quad x \neq 2; -2$$

$$\frac{4x}{(x+2)(x-2)} - \frac{2(x+2)}{(x+2)(x-2)} = \frac{2(x-2)}{(x+2)(x-2)} \quad | \cdot (x+2)(x-2)$$

$$4x - 2(x+2) = 2(x-2)$$

$$4x - 2x - 4 = 2x - 4$$

$$2x - 4 = 2x - 4 \quad | - 2x$$

$$\underline{\underline{-4 = -4 \quad 1}}$$

$$\mathbb{L} = \underline{\underline{\mathbb{Q} \setminus \{ +2; -2 \}}}$$

$$5. \quad \frac{5}{3-3x} - \frac{1}{x^2-1} = 0 \quad x \neq 1; -1$$

$$\frac{5}{3(1-x)} - \frac{1}{(x+1)(x-1)} = 0$$

$$-\frac{5}{3(x-1)} - \frac{1}{(x+1)(x-1)} = 0$$

$$-\frac{5(x+1)}{3(x+1)(x-1)} - \frac{3}{3(x+1)(x-1)} = 0 \quad | \cdot 3(x+1)(x-1)$$

$$-5(x+1) - 3 = 0$$

$$-5x - 5 - 3 = 0$$

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$$-5x - 8 = 0 \quad | + 5x$$

$$-8 = 5x \quad | : 5$$

$$\underline{\underline{-\frac{8}{5} = x \quad || \cdot 5}}$$

$$\underline{\underline{L = \left\{ -\frac{8}{5} \right\} \quad || \cdot 5}}$$

$$6. \quad \frac{x+4}{x} = \frac{x+3}{x-1} \quad x \neq 0; 1$$

$$\frac{(x+4)(x-1)}{x(x-1)} = \frac{(x+3)(x)}{x(x-1)} \quad | \cdot x(x-1)$$

$$(x+4)(x-1) = (x+3) \cdot x$$

$$\cancel{x^2} + 3x - 4 = \cancel{x^2} + 3x \quad | - 3x$$

$$\underline{\underline{-4 = 0 \quad || \cdot 1}}$$

$$\underline{\underline{L = \{ \} \quad || \cdot 1}}$$

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$$\underline{7.} \quad \frac{3}{x-2} + \frac{4}{x} = \frac{6}{x^2-2x} \quad x \neq 0; 2$$

$$\frac{3}{x-2} + \frac{4}{x} = \frac{6}{x(x-2)}$$

$$\frac{3x}{x(x-2)} + \frac{4(x-2)}{x(x-2)} = \frac{6}{x(x-2)} \quad | \cdot x(x-2)$$

$$3x + 4(x-2) = 6$$

$$3x + 4x - 8 = 6$$

$$7x - 8 = 6$$

| +8

$$7x = 14$$

| : 7

$$\underline{x = 2} \quad \text{Nk}$$

$$\underline{\underline{L = \{2\}}} \quad \text{Nk}$$

15 Punkte