

$$1. \quad \frac{3x^2+2}{6x} - \frac{x+3}{2} = 0 \quad | \cdot 6x \quad x \neq 0$$

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

$$\cancel{3x^2}+2 - \cancel{3x^2} - 9x = 0 \quad | + 9x$$

$$2 = 9x \quad | : 9$$

$$\underline{\underline{\frac{2}{9} = x}} \quad 1$$

$$\underline{\underline{L = \left\{ \frac{2}{9} \right\}}} \quad 1/2$$

$$2. \quad x - \frac{3-x}{2} < 1 - \frac{2x}{5} \quad | \cdot 10$$

$$10x - 5(3-x) < 10 - 4x$$

$$10x - 15 + 5x < 10 - 4x$$

$$15x - 15 < 10 - 4x \quad | + 4x$$

$$19x - 15 < 10 \quad | + 15$$

$$19x < 25 \quad | : 19$$

$$\underline{\underline{x < \frac{25}{19}}} \quad 1$$

$$\underline{\underline{L = \{ 1, 0, -1, -2, \dots \}}} \quad 1/2$$

$$\underline{3.} \quad \frac{x}{2} < \frac{2x}{4} - \frac{x-5}{6} < x-1 \quad | \cdot 12$$

$$6x < 6x - 2(x-5) < 12x - 12$$

$$6x < 6x - 2x + 10 < 12x - 12$$

$$6x < 4x + 10 < 12x - 12$$

$$6x < 4x + 10 \quad | -4x$$

$$2x < 10 \quad | : 2$$

$$\underline{x < 5}$$

$$4x + 10 < 12x - 12 \quad | -4x$$

$$10 < 8x - 12 \quad | +12$$

$$22 < 8x \quad | : 8$$

$$\frac{22}{8} < x$$

$$\underline{x > \frac{11}{4}}$$

$$\underline{\underline{L = \{ 3, 4 \}}}$$

$$\underline{4.} \quad \frac{6x-5x}{3} - \left(\frac{1}{x} - \frac{1}{4x} \right) = -\frac{10x-3}{6} \quad | \cdot 12x$$

$$4x(6-5x) - (12-3) = -2x(10x-3) \quad x \neq 0$$

$$24x - \cancel{20x^2} - 12 + 3 = -\cancel{20x^2} + 6x$$

$$24x - 9 = 6x \quad | -6x$$

$$18x - 9 = 0 \quad | +9$$

$$18x = 9 \quad | : 18$$

$$\underline{x = \frac{9}{18} = \frac{1}{2}}$$

$$\underline{\underline{L = \left\{ \frac{1}{2} \right\}}}$$

$$5. \quad \frac{1}{x-1} = \frac{3}{4-4x^2} \quad x \neq +1; -1$$

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

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

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

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

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

$$-7 = 4x \quad | : 4$$

$$\underline{-\frac{7}{4} = x} \quad 1$$

$$\underline{\underline{L = \left\{ -\frac{7}{4} \right\}}}$$

14

$$6. \quad \frac{1}{5+x} - \frac{1}{3-x} = \frac{7}{x^2+2x-15}$$

$$\frac{1}{x+5} + \frac{1}{x-3} = \frac{7}{(x+5)(x-3)} \quad | \cdot (x+5)(x-3)$$

$$(x-3) + (x+5) = 7$$

$$2x + 2 = 7 \quad | - 2$$

$$2x = 5 \quad | : 2$$

$$\underline{x = \frac{5}{2}} \quad 1$$

$$\underline{\underline{L = \left\{ \frac{5}{2} \right\}}}$$

14

$$7. \quad \frac{x-1}{x+3} < \frac{3x-1}{3x+12} \quad x \neq -3; -4$$

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

$$3(x+4)(x-1) < (3x-1)(x+3)$$

$$\cancel{3x^2} + 9x - 12 < \cancel{3x^2} + 8x - 3 \quad | - 8x$$

$$x - 12 < -3 \quad | + 12$$

$$\underline{x < 9} \quad \uparrow$$

$$\mathbb{L} = \{ \underline{8, 7, \dots, 1, 0, -1, -2, -5, -6, \dots} \} \frac{1}{2}$$

$$8. \quad \frac{1}{x-1} = \frac{1}{x} - \frac{1-x}{x^2-x} \quad x \neq 0; +1$$

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

$$x = x-1 - (1-x)$$

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

$$0 = x - 2 \quad | + 2$$

$$\underline{2 = x} \quad \uparrow$$

$$\mathbb{L} = \{ \underline{2} \} \frac{1}{2}$$

12 Pkte