

**W1 – 3.4 Solve Rational Equations and Inequalities**

**MHF4U**

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1) Solve each equation algebraically.

a)  $\frac{6}{2x-1} = 5$

b)  $\frac{6}{x} = x - 5$

c)  $1 = \frac{5}{3x^2-8x+2}$

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

$$\mathbf{e)} \frac{3}{x+5} + \frac{4}{x} = 0$$

$$\mathbf{f)} 2x = 5 - \frac{3}{x}$$

$$\mathbf{g)} \frac{2}{1-x} + \frac{3}{x+1} = \frac{1}{x}$$

$$\mathbf{h)} \frac{3}{x-1} + 5 + \frac{2}{x} = 0$$

2) Solve each inequality without using technology.

a)  $\frac{4}{2x-3} < \frac{1}{x+4}$

b)  $\frac{2x+3}{x-3} \geq \frac{6x-5}{3x+1}$

c)  $\frac{(x-3)(2x-1)}{(x+4)(x-5)} > 0$

d)  $\frac{2x^2+5x-3}{x^2+5x+4} \leq 0$

$$\mathbf{e)} \frac{4}{x-3} < 1$$

$$\mathbf{f)} \frac{2x^2+5x-3}{x^2+8x+16} < 0$$

$$\mathbf{g)} \frac{x}{x+3} > \frac{x}{x-1}$$

$$\mathbf{h)} \frac{2x+3}{x} > \frac{x+1}{x}$$

## Answer Key

1) **a)**  $x = 1.1$  **b)**  $x = 6$  or  $x = -1$  **c)**  $x = 3$  or  $x = -\frac{1}{3}$  **d)**  $x = 7$  **e)**  $x = -\frac{20}{7}$  **f)**  $x = 1$  or  $x = \frac{3}{2}$   
**g)**  $x = \frac{1}{5}$  **h)**  $x = \pm\sqrt{0.4}$

2) **a)**  $x < -\frac{19}{2}$  or  $-4 < x < \frac{3}{2}$  **b)**  $-\frac{1}{3} < x \leq \frac{6}{17}$  or  $x > 3$  **c)**  $x < -4$  or  $\frac{1}{2} < x < 3$  or  $x > 5$

**d)**  $-4 < x \leq -3$  or  $-1 < x \leq \frac{1}{2}$  **e)**  $x < 3$  or  $x > 7$  **f)**  $-3 < x < \frac{1}{2}$

**g)**  $x < -3$  or  $0 < x < 1$  **h)**  $x < -2$  or  $x > 0$