Name: MS Yelton Period: Date:

Practice Worksheet: Solving Rational Equations

Solve each equation and check for extraneous solutions. You must show work and your answers must be correct to get credit.

Level 1	Level 2	Level 3
1] $\frac{x}{4} = \frac{9}{4x}$ $x \neq 0$ $36 = 4x^2$ $x^2 = 9$ $x = \pm 3$	5] $\frac{2}{1} = \frac{x+2}{x-3}$ $x \neq 3$ $1(x+2) = 2(x-3)$ $x + 2 = 2x - 6$ $-x \quad +6 \quad -x \quad +6$ $8 = x$ $x = 8$	9] $\frac{x^2+3}{7x} = \frac{x+1}{6}$ $x \neq 0$ $7x(x+1) = 6(x^2+3)$ $7x^2 + 7x = 6x^2 + 18$ $-6x^2 \quad -18 \quad -6x^2 \quad -18$ $x^2 + 7x - 18 = 0$ $(x+9)(x-2) = 0$ $x = -9 \quad x = 2$
2] $\frac{x}{4} = \frac{x+2}{2}$ $4(x+2) = 2x$ $4x + 8 = 2x$ $-2x \quad -2x$ $2x + 8 = 0$ $2(x+4) = 0$ $2 \neq 0 \quad x+4 = 0$ $x = -4$	6] $\frac{x}{2x+1} = \frac{2x}{x+2}$ $x \neq -2$ $x \neq -\frac{1}{2}$ $2x(2x+1) = x(x+2)$ $4x^2 + 2x = x^2 + 2x$ $3x^2 = 0$ $x^2 = 0$ $x = 0$	10] $\frac{2}{x^2-x} = \frac{1}{x-1}$ $x \neq 1$ $x \neq 0$ $2(x-1) = 1(x^2-x)$ $2x - 2 = x^2 - x$ $0 = x^2 - 3x + 2$ $0 = (x-1)(x-2)$ $x \neq 1 \quad x = 2$ Extraneous $x^2 - x = 0$ $x(x-1) = 0$ $x = 0 \quad x = 1$
3] $\frac{4}{x} + \frac{1}{1} \cdot \frac{x}{x} = \frac{2x+2}{x}$ CD: x $x \neq 0$ $\left(\frac{4}{x} + \frac{x}{x} = \frac{2x+2}{x}\right)x$ $4 + x = 2x + 2$ $-2 \quad -x \quad -x \quad -2$ $2 = x$ $x = 2$	7] $\frac{9}{x+1} - 1 = \frac{3}{x+1} + 2$ $x \neq 0$ CD: x $\frac{9}{x} = \frac{3}{x} + \frac{3}{1} \cdot x$ $\left(\frac{9}{x} = \frac{3}{x} + \frac{3x}{x}\right)x$ $9 = 3 + 3x$ $6 = 3x$ $2 = x$ $x = 2$	11] $\frac{x^2}{3x-1} + \frac{2}{1} \cdot \frac{(3x-1)}{(3x-1)} = \frac{2(x-3)}{1(3x-1)3x-1}$ $x \neq 1/3$ CD: $3x-1$ $\left(\frac{x^2}{3x-1} + \frac{2(3x-1)}{3x-1} = \frac{2(x-3)}{3x-1}\right)3x-1$ $x^2 + 2(3x-1) = 2(x-3)$ $x^2 + 6x - 2 = 2x - 6$ $x^2 + 4x + 4 = 0$ $(x+2)(x+2) = 0$ $x = -2 \quad x = -2$ $x = -2$
4] $\frac{2x(x+2)}{x-2(x+2)x+2} + \frac{1(x-2)}{(x+2)(x-2)} = \frac{10}{x^2-4}$ Factor! $x \neq 2 \quad x \neq -2$ $(x+2)(x-2)$ $\frac{2x(x+2)}{(x-2)(x+2)} + \frac{1(x-2)}{(x-2)(x+2)} = \frac{10}{(x-2)(x+2)}$ $2x^2 + 4x + x - 2 = 10$ $2x^2 + 5x - 12 = 0$ $(x+4)(2x-3) = 0$ $x = -4 \quad x = 3/2$	8] $\frac{x(x-2)}{x-1(x-2)} - \frac{1(x-1)}{x-2(x-1)} = \frac{2x-5}{x^2-3x+2}$ $-2,-1 \quad +3$ $x \neq 1 \quad x \neq 2$ $(x-2)(x-1)$ $\frac{x(x-2)}{(x-1)(x-2)} - \frac{1(x-1)}{(x-2)(x-1)} = \frac{2x-5}{(x-2)(x-1)}$ $x(x-2) - 1(x-1) = 2x-5$ $x^2 - 2x - x + 1 = 2x - 5$ $x^2 - 5x + 6 = 0$ $(x-2)(x-3) = 0$ $x = 2 \quad x = 3$ Extraneous	12] $\frac{x(2x+1)}{2x-1(2x+1)} - \frac{2(2x-1)}{2x+1(2x-1)} = \frac{x^2+20}{4x^2-1}$ $x \neq 1/2$ $x \neq -1/2$ $(2x-1)(2x+1)$ $\frac{x(2x+1)}{(2x-1)(2x+1)} - \frac{2(2x-1)}{(2x-1)(2x+1)} = \frac{x^2+20}{(2x-1)(2x+1)}$ $x(2x+1) - 2(2x-1) = x^2 + 20$ $2x^2 + x - 4x + 2 = x^2 + 20$ $x^2 - 3x - 18 = 0$ $(x-6)(x+3) = 0$ $x = 6 \quad x = -3$

Find a common denominator

-24 | 5
8, -3