Name:_____ Date:_____

M8H HW Ch2 Lesson 5: Solving Equations Involving Reciprocals and Square Roots

1. Solve the following equations and check your answers:

a) $x = \frac{1}{x}$

b) $\frac{3}{b} = \frac{1}{12}$

c) $\frac{a}{5} = \frac{5}{a}$

d) $\frac{2}{y} = \frac{3}{\left(\frac{1}{2}\right)}$

e) $4 = \frac{2}{3 + \frac{1}{x}}$

f) $\frac{1\frac{1}{4}}{x} = \frac{8}{3}$

g) $\frac{8}{x} = \frac{x}{18}$

h) $\frac{4}{x} = \frac{\left(\frac{1}{9}\right)}{\left(\frac{1}{x}\right)}$

i) $\frac{3\frac{1}{2}}{4\frac{2}{3}} = \frac{9\frac{3}{7}}{n}$

j) $\frac{2}{y+5} = \frac{7}{y}$

k) $\frac{2}{n+10} = \frac{6}{n}$

l) $\frac{1-x}{4+x} = \frac{2}{3}$

m) $\frac{2}{y+5} = \frac{7}{y}$

n) $\frac{2+\frac{12}{x}}{\frac{2}{x}+3} = 4$

0) $\frac{4+\frac{3}{x}}{\frac{3}{x}+\frac{1}{3}} = 3$

p) $\frac{\frac{1}{4}-\frac{2}{x}}{\frac{2}{x}-\frac{1}{4}} = y$

2. Solve the following equations by eliminating the root function. Remember to check your solutions!!

a) $3=\sqrt{2+x}$	b) $5=2+\sqrt{4-x}$	c) $\sqrt{2x-1}=4$	d) $3-\sqrt{\frac{x}{2}+3}=1$
e) $3+\sqrt{2x+3}=2$	f) $\frac{1}{\sqrt{2x+1}}-2=\frac{3}{2}$	g) $\sqrt{2+\sqrt{x}}=2$	h) $\sqrt{1+\sqrt{2+\sqrt{x}}}=3$
i) $\sqrt{\sqrt{\sqrt{3x}}}=4$	j) $\frac{2}{\sqrt{x}}=\frac{4}{x}$	k) $\sqrt{2-2x}+1=4$	l) $2-\sqrt{1-4x}=1$

3. Isolate the indicated variable in each expression:

a) $\frac{A}{B}=\frac{C}{D};\ \text{for } C$	b) $\frac{A}{B}=\frac{C}{D};\ \text{for } D$	c) $\frac{A}{B}=\frac{C}{D};\ \text{for } B$	d) $\frac{A}{B}+\frac{A}{C}=1;\ \text{for } A$
e) $\frac{A}{B}+\frac{A}{C}=\frac{1}{BC};\ \text{for } A$	f) $\frac{A}{B}+\frac{A}{F}=\frac{C}{D};\ \text{for } A$	g) $\frac{1}{A}+\frac{1}{B}+\frac{1}{C}=\frac{1}{D};\ \text{for } D$	h) $\frac{\frac{1}{A}+\frac{1}{B}}{\frac{1}{A}-\frac{1}{B}}=C;\ \text{for } A$

4. Solve the following equations:

a) $\dfrac{3}{4+\dfrac{x}{3+\dfrac{1}{7}}}=1$	b) $1+\dfrac{x}{2+\dfrac{1}{1-\dfrac{1}{2}}}=7$
c) $5\dfrac{4}{5}=1+\dfrac{x}{1+\dfrac{1}{1+\dfrac{1}{1+1}}}$	d) $\dfrac{1}{1+\dfrac{2}{1+\dfrac{3}{1+x}}}=2$
e) $1+\dfrac{2+\dfrac{12}{x}}{\dfrac{x}{2}+3}=\dfrac{2}{x}$	f) $\dfrac{1}{\sqrt{1+\dfrac{1}{\sqrt{\dfrac{1}{1+\sqrt{x}}}}}}=\dfrac{1}{3}$

5. Suppose that "a", "b", "c", and "d" are positive integers such that the equation below is true, what is the value of *a + b + c + d*?

$$a+\dfrac{1}{b+\dfrac{1}{c+\dfrac{1}{d}}}=\dfrac{37}{11}$$

6. Solve for “x”

$$4=\sqrt{x+\sqrt{x+\sqrt{x+\sqrt{x+.....}}}}$$

7. Solve for “x”

$$\frac{1}{1\cdot 2}+\frac{1}{2\cdot 3}+\frac{1}{3\cdot 4}+\frac{1}{4\cdot 5}+\frac{1}{5\cdot 6}+....+\left(\frac{1}{2008\cdot 2009}\right)+\left(\frac{1}{2009\cdot 2010}\right)=\frac{1}{x}$$

8. Challenge: Solve for “x”

$$\sqrt{x-1}+4=3+\sqrt{x+1}$$