Solving Rational Equations.

Basic Steps:

1. Eliminate ALL denominators
2. Solve the equation that remains after eliminating denominators
3. Check for extraneous solutions

Solve.

$$\frac{x}{x^2-100}=\frac{1}{x^2-12x+20}$$

$$\frac{x-2}{x-2}\cdot\frac{x}{(x+10)(x-10)}=\frac{1}{(x-10)(x-2)}\cdot\frac{(x+10)}{(x+10)}$$

$$x^2-2x=x+10$$

$$x^2-3x-10=0$$

$$(x-5)(x+2)=0$$

$-10$, $-5$, $+2$, $-3$

$x=5,-2$

Solve.

$$(x+8)(x-5)\left(\frac{4}{x-5}+\frac{38}{x^2+3x-40}\right)=\left(\frac{x}{x+8}\right)(x+8)(x-5)$$

$$(x-5)(x+8)$$

$$4(x+8)+38=x(x-5)$$

$$4x+32+38=x^2-5x$$

$+70$

$$0=x^2-9x-70$$

$$0=(x-14)(x+5)$$

$-70$, $-14$, $5$, $-9$

$x=14,-5$

Problems similar to "book" problems

$$\frac{2x+8}{x^2-16}+\frac{7}{-x-4}=\frac{5}{x-4}$$

$$(x+4)(x-4)$$

$$\frac{7}{-x-4}=\frac{7}{-1(x+4)}$$

$$\frac{-1}{-1}\cdot\frac{3}{5-x}-\frac{4x}{x^2-25}=\frac{8}{x+5}$$

$$(x+5)(x-5)$$

$$\frac{-3}{x-5}$$

$$\frac{7}{-x-4}\cdot\frac{-1}{-1}=\frac{-7}{x+4}$$

$$-\frac{2}{x+4}$$

You can now finish Hwk #1

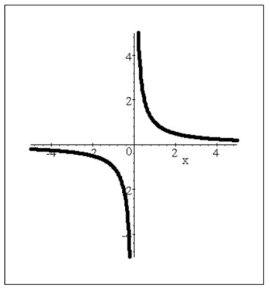
Sec 9-6

Pages 524-526

Problems 5, 8, 14, 41, 46, 50, 51

Graph of

$y = 1/x$




Asymptotes: Lines that a graph approaches more and more closely the further from the origin you are.

Vertical Asymptotes:

the y-axis
EQ: x=0

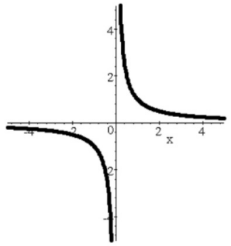
Horizontal Asymptotes:

the x-axis
EQ: y=0

Inverse Variation: $y = \frac{k}{x}$

Is also called the Reciprocal Function.

The Parent Reciprocal Funciton is: $y = \frac{1}{x}$




It has two branches which are in the 1st and 3rd quadrants.

On your graphing calculator graph the parent function:

Use the following WINDOW: x [-5,5] y [-5,5]

$Y_1 = \frac{1}{x}$

In $Y_2$ graph other recripocal functions using different values for a

Describe how the graph of $y = \frac{a}{x}$ changes for different values of a.

$$y = \frac{a}{x}$$

a is pos:

Branches are in the
1st and 3rd Quadrants

a is neg:

Branches are in the
2nd and 4th Quadrants

a is large:

Branches are further
from the origin

a is small:

Branches are closer to
the origin