

Math 7 Review - Rationals

**Simplify Rational Expressions**

Simplify. State any restrictions on the variable.

1.  $\frac{p-4-32}{p+4}$

$p-8$   
 $p \neq -4$

2.  $\frac{x^2+3x-28}{x^2-49}$

$\frac{x-4}{x-7}$   
 $x \neq -7, 7$

3.  $\frac{2m^2+10m-48}{8m+64}$

$\frac{m-3}{4}$   
 $m \neq -8$

**Multiply/Divide Rational Expressions**

Simplify. Remember to keep, change, flip when dividing.

4.  $\frac{z}{z+1} \cdot \frac{z^2+3z+2}{z^2+3z}$

$\frac{z(z+2)}{z+3}$

$z \neq 0, -3, -1$

5.  $\frac{c+1}{c-5} + \frac{c-2}{c^2-7c+10}$

$\frac{c+1}{c-5}$   
 $c \neq 5, 2$

6.  $\frac{x^2-16}{x^2+5x+6} \div \frac{x^2+5x+4}{x^2-2x-8}$

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

$x \neq -3, -2, -4, -1, 4$

7.  $\frac{b^2}{b+9} \cdot \frac{b^2+15b+54}{b^2-4b}$

$\frac{b(b+6)}{b-4}$

$b \neq -9, 0, 4$



NAME KEY

**Add/Subtract Rational Expressions**

Simplify. Remember to get a common denominator first.

8.  $\frac{3}{m+5} + \frac{8}{m^2-25}$

$\frac{3m-7}{(m+5)(m-5)}$

9.  $\frac{k^2-7k-8}{k^2+k-2} - \frac{6}{k-1}$

$\frac{k-10}{k-1}$

10.  $\frac{w^2+2w-24}{w^2+w-30} + \frac{8}{w-5}$

$\frac{w+4}{(w-5)(w-3)}$

11.  $\frac{3}{x+7} - \frac{4}{x-8}$

$\frac{-x-52}{(x+7)(x-8)}$

**Solve Rational Equations**

Solve. Remember to check for extraneous solutions.

12.  $\frac{-2}{x+4} = \frac{4}{x+3}$

$x = \frac{-11}{3}$

13.  $\frac{v}{v-4} = \frac{16}{v-4}$

$v = -4$

14.  $\frac{a}{a^2-36} + \frac{2}{a-6} = \frac{1}{a+6}$

$a = -9$

# Graphs of Rational Functions

Identify holes, vertical asymptotes, horizontal asymptotes, and domain of the rational functions. Then graph the function.

15.  $f(x) = \frac{3x^2+21x}{x^2+5x-14}$

16.  $f(x) = \frac{4}{(x+3)(x-1)}$

17.  $f(x) = \frac{x^2-9x+20}{4x^2-12x-40}$



Hole:	$x = -7$
VA:	$x = 2$
HA:	$y = 3$
Domain:	$x \neq -7, 2$

Hole:	None
VA:	$x = -3, x = 1$
HA:	$y = 0$
Domain:	$x \neq -3, 1$

Hole:	$x = 5$
VA:	$x = -2$
HA:	$y = \frac{1}{4}$
Domain:	$x \neq 5, -2$

