

**Rational Functions Review**

Simplify. State any restrictions on the variable.

1.  $\frac{p^2-4p-32}{p+4} = \frac{(p-8)(p+4)}{p+4} = p-8$   
 $p \neq -4$

2.  $\frac{x^2+3x-28}{x^2-49} = \frac{(x-7)(x+4)}{(x-7)(x+7)} = \frac{x+4}{x+7}$   
 $x \neq -7, -4$

3.  $\frac{2m^2+10m-48}{8m+64} = \frac{2(m-4)(m+6)}{8(m+8)} = \frac{m-3}{4}$   
 $m \neq -8$

Multiply or Divide.

4.  $\frac{z^2}{z+1} \cdot \frac{z^2+3z+2}{z^2+3z} = \frac{z(z+2)}{z+3}$   
 $z \neq -2, -1, -3$

5.  $\frac{c+1}{c-5} \div \frac{c-2}{c^2-7c+10} = \frac{(c+1)(c-5)}{(c-2)(c-5)}$   
 $c \neq 5, 2$

6.  $\frac{x^2-16}{x^2+5x+6} \div \frac{x^2+5x+4}{x^2-2x-8} = \frac{(x-4)(x+4)}{(x+3)(x+1)}$   
 $x \neq -2, -3, 4, -4, -1$

7.  $\frac{b^2}{b+9} \cdot \frac{b^2+15b+54}{b^2-4b} = \frac{b(b+6)(b+9)}{b(b-4)(b+9)}$   
 $b \neq -9, 4$

Add or Subtract

8.  $\frac{3}{m+5} + \frac{8}{m^2-25} = \frac{3m-7}{(m-5)(m+5)}$   
 $m \neq 5, -5$

9.  $\frac{k^2-2k-8}{k^2+k-2} - \frac{6}{k-1} = \frac{(k-10)(k-1)}{(k-1)(k-2)}$   
 $k \neq 1, -2$

10.  $\frac{w^2+2w-24}{w^2+w-30} + \frac{8}{w-5} = \frac{(w+4)(w-5)}{(w-5)(w-6)}$   
 $w \neq -6, 5$

11.  $\frac{3}{x+7} - \frac{4}{x-8} = \frac{-(x+52)}{(x+7)(x-8)}$   
 $x \neq -7, 8$

Solve.

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

13.  $\frac{v^2}{v-4} = \frac{16}{v-4}$

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

$x = \frac{-22}{6}$

$v = \pm 4$

$a = -9$

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

$v = 4$

$a \neq 6, -6$

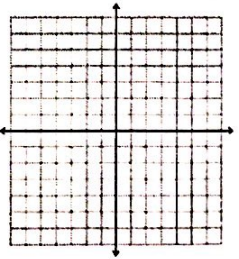
$x \neq -4, -3$

Extraneous

Identify holes, vertical asymptotes, horizontal asymptotes, domain, x-intercept(s), and y-intercept of the rational functions. Then graph the function.

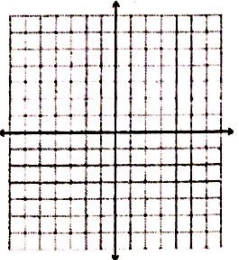
15.  $y = \frac{3x^2+21x}{x^2+5x-14}$

Hole:	$x = -7$
VA:	$x = 2$
HA:	$y = 3$
Domain:	$\mathbb{R}, x \neq -7, 2$
x-Intercept(s)	
y-Intercept	



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

Hole:	None
VA:	$x = -3$ $x = 1$
HA:	$y = 0$
Domain:	$\mathbb{R}, x \neq -3, 1$
x-Intercept(s)	
y-Intercept	



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

Hole:	$x = 5$
VA:	$x = -2$
HA:	$y = \frac{1}{4}$
Domain:	$\mathbb{R}, x \neq 5, -2$
x-Intercept(s)	
y-Intercept	

