Rational Functions Review

Simplify. State any restrictions on the variable.

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

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 or Divide.

4. $\frac{z^2}{z+1} \cdot \frac{z^2+3z+2}{z^2+3z}$ $\frac{z(z+2)}{z+3}$ $z \neq 0, -1, -3$

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

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

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

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

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

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

Solve.

12. $\frac{-2}{x+4} = \frac{4}{x+3}$ $x = \frac{-22}{6}$ $\Rightarrow x = \frac{-11}{3}$ $x \neq -4, -3$

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

14. $\frac{a}{a^2-36} + \frac{2}{a-6} = \frac{1}{a+6}$ $a = -9$ $a \neq 6, -6$

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