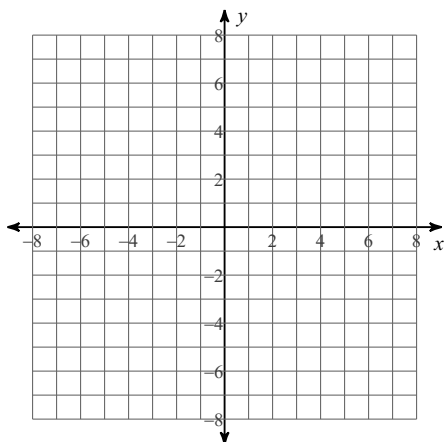


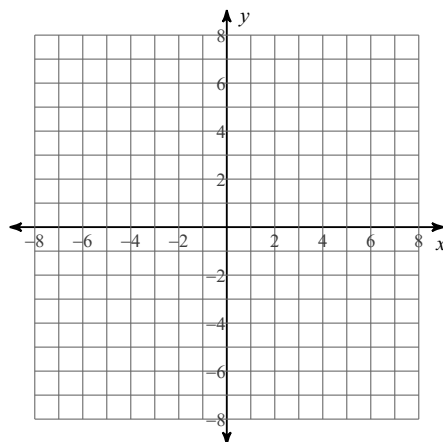
## Rational Functions Review

**Graph each function. Identify the horizontal asymptote, vertical asymptote, x and y-intercepts and domain.**

$$1) f(x) = \frac{3}{x} + 2$$

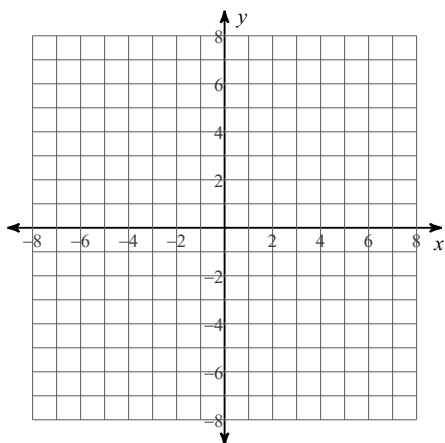


$$2) f(x) = -\frac{1}{x-2} + 3$$

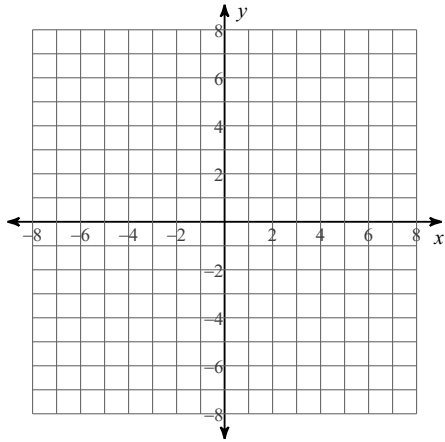


**Identify the holes, vertical asymptotes, x-intercepts, horizontal asymptote, and domain of each. Then sketch the graph.**

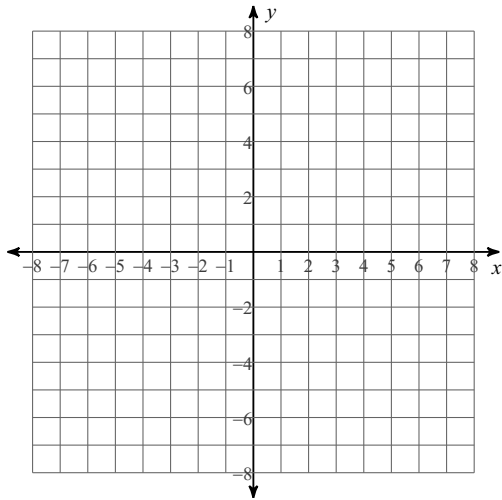
$$3) f(x) = \frac{x^2 - 5x + 4}{-4x^2 + 4x + 24}$$



$$4) f(x) = \frac{x^3 - 4x^2 + 3x}{-3x^3 + 12x}$$



$$5) y = \frac{x + 4}{x^2 + 2x - 3}$$



**Solve each equation. Remember to check for extraneous solutions.**

$$6) \frac{1}{r^2 - r} - \frac{8}{r} = \frac{2}{r^2 - r}$$

$$7) \frac{1}{a - 5} - \frac{1}{a^2 - a - 20} = \frac{3}{a^2 - a - 20}$$

**Simplify each and state the excluded values.**

$$8) \frac{1}{7x+1} \cdot \frac{63x+9}{x+9}$$

$$9) \frac{28n^3 + 40n^2}{4n^3 - 24n^2} \div \frac{7n+10}{9}$$

$$10) \frac{5x^2 - 34x + 24}{7x^2} \div \frac{5x-4}{7x^2}$$

$$11) \frac{k+5}{56k+24} \cdot \frac{35k^2 - 6k - 9}{5k-3}$$

**Simplify each expression. Identify domain restrictions.**

$$12) \frac{2m}{m+1} - \frac{2}{2m-3}$$

$$13) \frac{6n}{4n-4} - \frac{5n}{n+1}$$

$$14) \frac{5}{2} + \frac{r+6}{10r^2 + 18r - 4}$$

$$15) \frac{4}{2} + \frac{m-4}{9m^2 - 45m + 36}$$

**Find the inverse of each function.**

$$16) f(x) = \frac{1}{x+2} + 2$$

$$17) f(x) = \frac{4}{x-1} - 3$$

**Solve the inequality. State your answer in interval notation.**

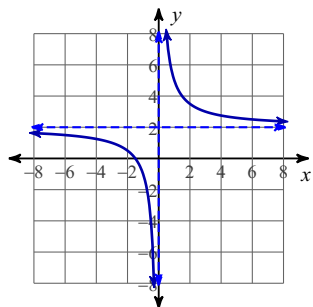
$$18) \frac{x+5}{x-4} < 0$$

$$19) \frac{x^2 + 8x - 20}{x-4} \geq 0$$

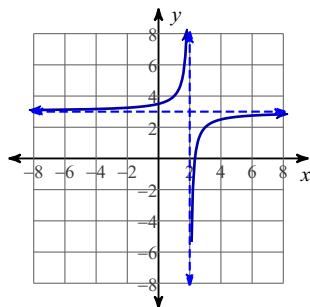
$$20) \frac{2x+1}{x-5} \geq 1$$

# Answers to Rational Functions Review

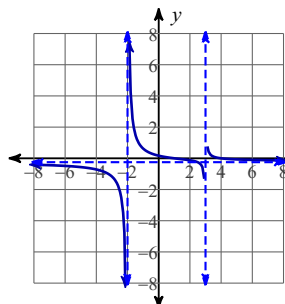
1)



2)

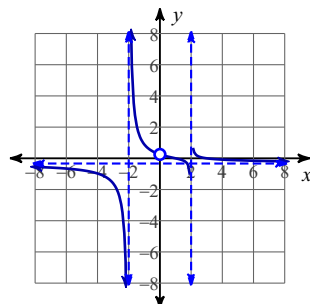


3)



Vertical Asym.:  $x = 3, x = -2$   
 Holes: None  
 Horz. Asym.:  $y = -\frac{1}{4}$   
 X-intercepts: 4, 1  
 Domain:  
 All reals except  $-2, 3$

4)



Vertical Asym.:  $x = 2, x = -2$   
 Holes:  $x = 0$   
 Horz. Asym.:  $y = -\frac{1}{3}$   
 X-intercepts: 3, 1  
 Domain:  
 All reals except  $-2, 0, 2$

5)

6)  $\left\{\frac{7}{8}\right\}$

7)  $\{0\}$

8)  $\frac{9}{x+9}; \left\{-\frac{1}{7}, -9\right\}$

9)  $\frac{9}{n-6}; \left\{0, 6, -\frac{10}{7}\right\}$

10)  $x - 6; \left\{0, \frac{4}{5}\right\}$

11)  $\frac{k+5}{8}; \left\{-\frac{3}{7}, \frac{3}{5}\right\}$

12)  $\frac{4m^2 - 8m - 2}{(2m-3)(m+1)}$

13)  $\frac{-7n^2 + 13n}{2(n-1)(n+1)}$

14)  $\frac{25r^2 + 46r - 4}{2(5r-1)(r+2)}$

15)  $\frac{18m-17}{9(m-1)}$

16)

17)

18)

19)

20)