Name:_____ **Date:**_____

Pre-Calculus 12 Review Assignment

Multiple Choice

Identify the choice that best completes the statement or answers the question.

____ **1.** Which of the reciprocal functions has a vertical asymptote with equation $x = \frac{9}{2}$?

A. $f(x) = \frac{1}{2x+9}$

B. $f(x) = \frac{1}{2x-9}$

C. $f(x) = \frac{9}{x+2}$

D. $f(x) = \frac{1}{x+\frac{9}{2}}$

____ **2.** What is the x-intercept of $f(x) = \frac{1}{2x+4}$?

A. There is no x-intercept.

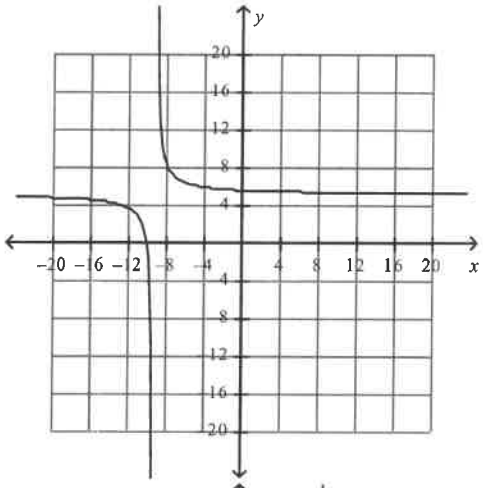
B. $-\frac{1}{2}$

C. -2

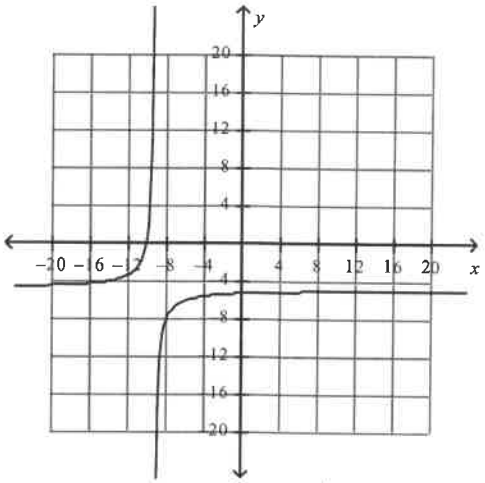
D. 0

____ **3.** Which graph represents the function $f(x) = \frac{-4}{x-9} - 5$?

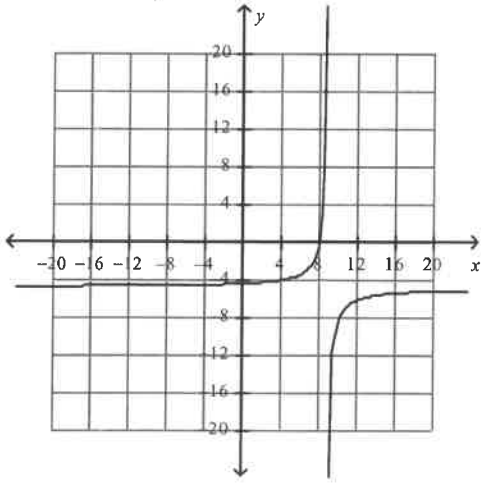
A.



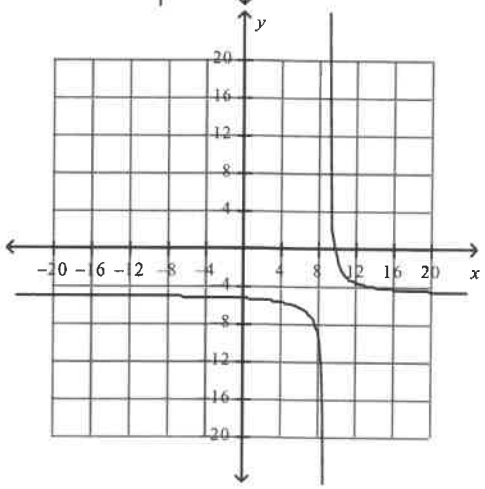
C.



B.



D.



____ **4.** What is the value of k in the function $f(x) = \frac{2-k}{5x+k}$ if its graph passes through the point $(3, -\frac{2}{19})$?

A. $-\frac{19}{2}$

B. 4

C. –10

D. No such k exists

____ **5.** Which function has a point of discontinuity at $x = 3$?

A. $f(x) = \frac{x-3}{2x^2-2x-12}$

B. $f(x) = \frac{x+3}{x^2-6x-12}$

C. $f(x) = \frac{x-3}{x^2-6x-12}$

D. $f(x) = \frac{x+3}{x^2-6x+9}$

____ **6.** Which function has a y-intercept of $-\frac{8}{27}$?

A. $f(x) = \frac{-8}{x^2-12x-27}$

B. $f(x) = \frac{8}{(-8x+3)(x+9)}$

C. $f(x) = \frac{-8}{x^2+12x+27}$

D. all of the above

____ **7.** Which function has a horizontal asymptote with equation $y = \frac{2}{7}$?

A. $f(x) = \frac{-2x-3}{7x+8}$

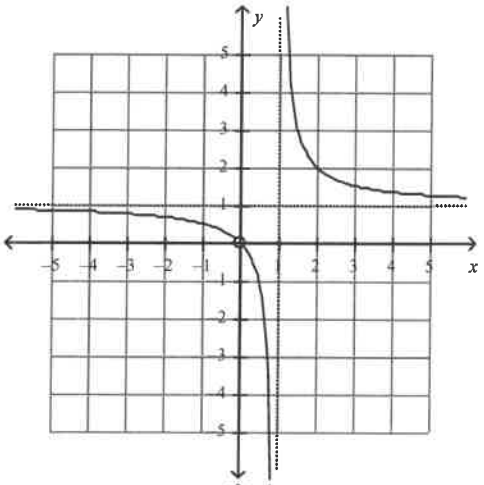
B. $f(x) = \frac{7x+8}{2x-3}$

C. $f(x) = \frac{7x-3}{2x+8}$

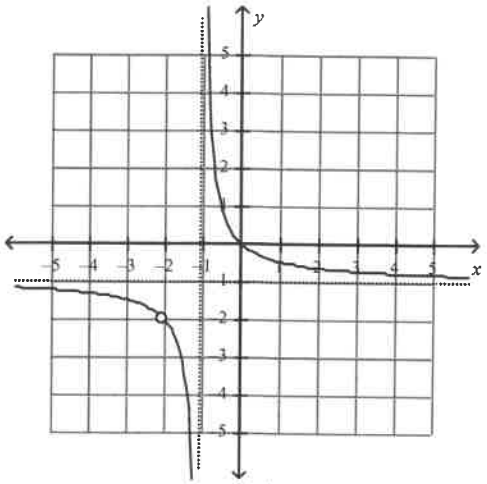
D. $f(x) = \frac{2x-3}{7x+8}$

____ **8.** Which graph of a rational function has the following characteristics?
- a vertical asymptote with equation $x = -1$
- a horizontal asymptote with equation $y = -1$
- a point of discontinuity at $(-2, -2)$

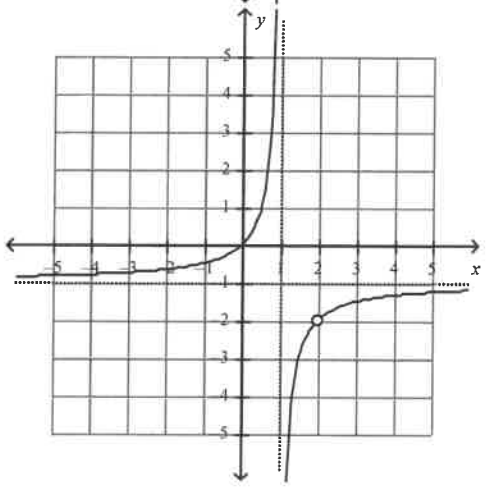
A.



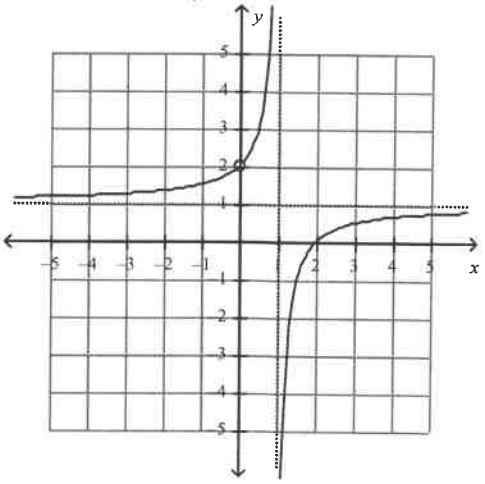
C.



B.



D.



____ **9.** Which function has a graph in the shape of a parabola?

A. $f(x) = \dfrac{(x-3)^2(x-7)}{(x-3)(x-7)}$

B. $f(x) = \dfrac{(x-3)^2(x-7)}{x-3}$

C. $f(x) = \dfrac{x-3}{(x-3)^3(x-7)}$

D. none of the above

____ **10.** Solve the equation $\dfrac{-1}{x+6} = 8 + x$.

A. $x = -7$

B. $x = -8$

C. $x = -6$

D. $x = -\dfrac{1}{7}$

____ **11.** Solve the equation $\frac{x+3}{x-8} = \frac{x+8}{x+9}$.

A. $x = -3$

B. $x = \frac{91}{12}$

C. $x = -\frac{91}{12}$

D. $x = 8, x = -9$

____ **12.** What are the x-intercepts of the graph of $f(x) = \frac{x^2 + 7x - 18}{x^2 + 12x + 35}$?

A. $-7, -5$

B. $2, -9$

C. $7, 5$

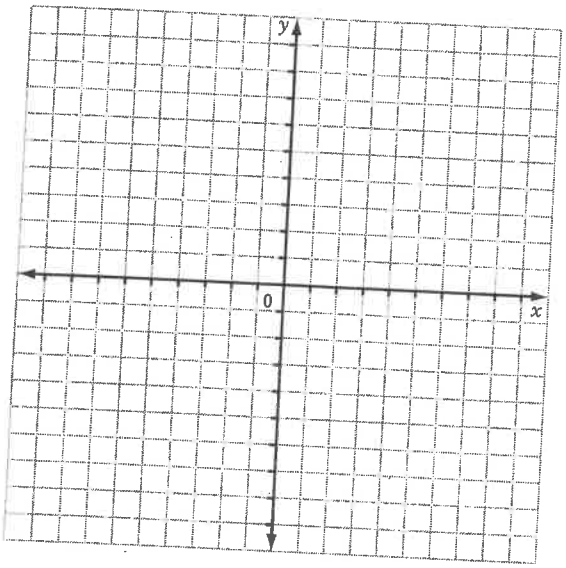
D. $-2, 9$

Chapter 9 Review

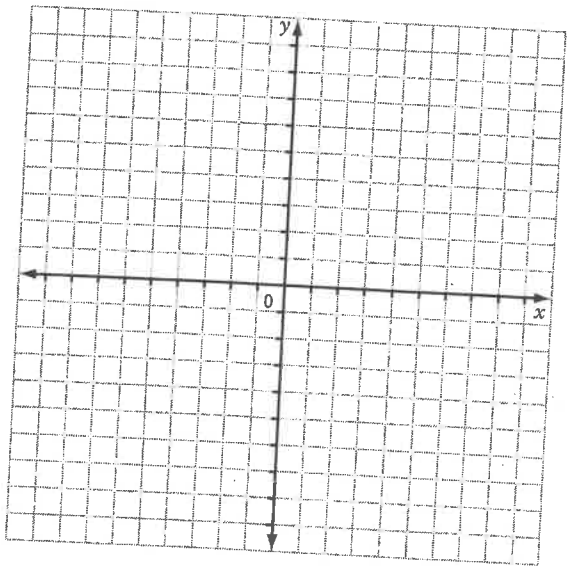
9.1 Exploring Rational Functions Using Transformations, pages 297–304

1. Graph each function using transformations. Label the important parts of the graph.

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

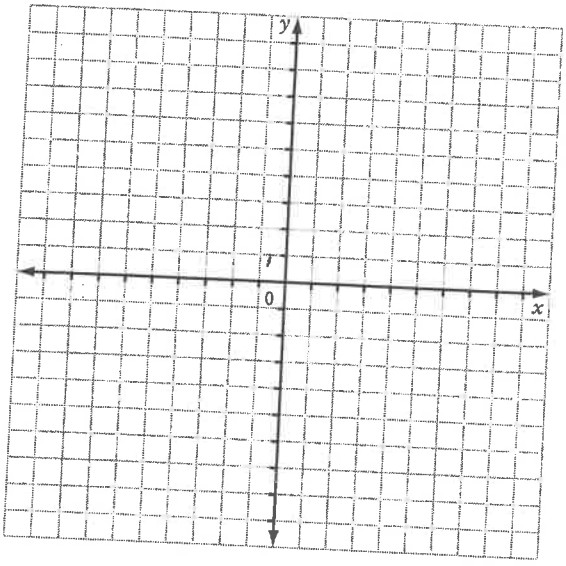


b) $y = \frac{7}{x-1} - 2$

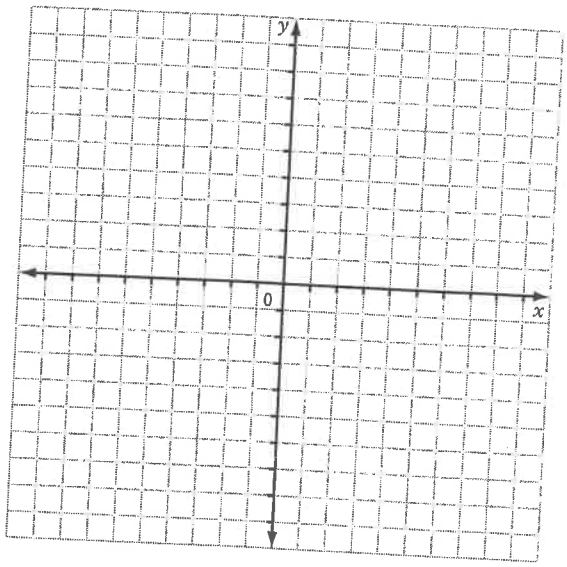


2. Graph the following functions without technology. Label all the important parts.

a) $f(x) = \frac{4x+5}{x-3}$



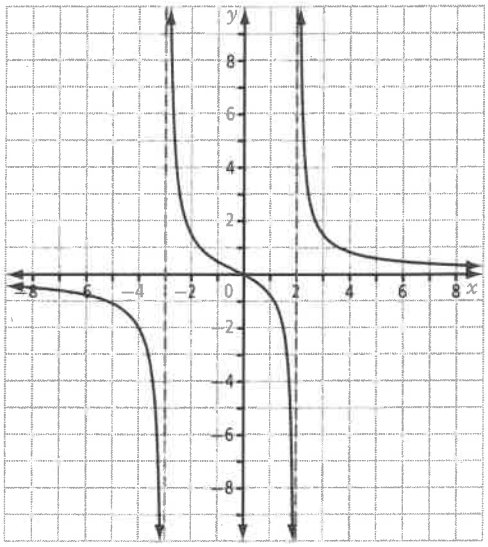
b) $f(x) = \frac{-2x+5}{x-3}$



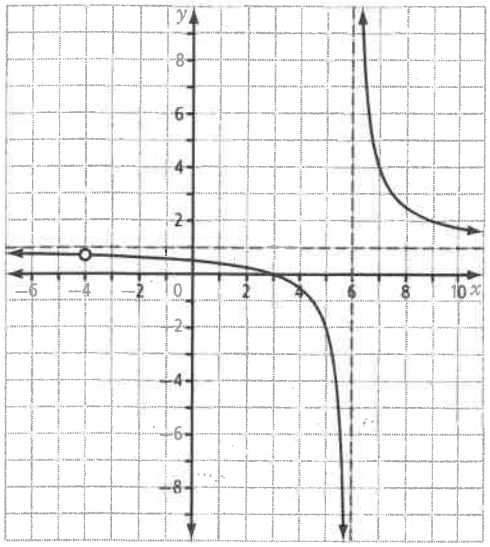
9.2 Analysing Rational Functions, pages 305–313

3. Match the graph of each rational function with the most appropriate equation. Give reasons for each choice.

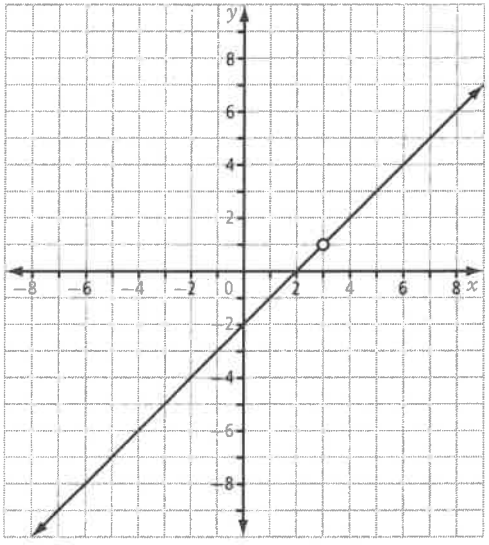
a)



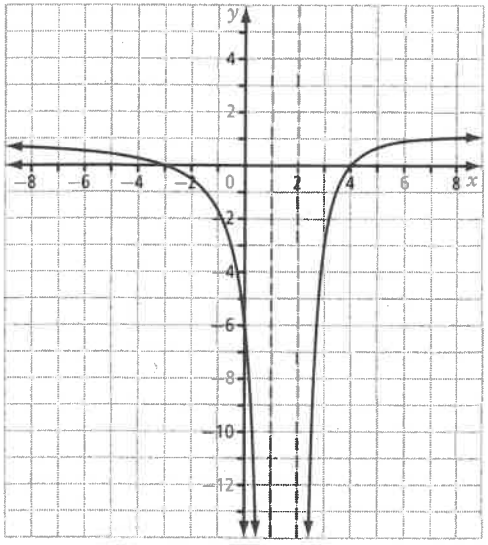
b)



c)



d)



A $f(x) = \dfrac{x^2 + x - 12}{x^2 - 2x - 24}$

B $g(x) = \dfrac{x^2 - x - 12}{x^2 - 3x + 2}$

C $h(x) = \dfrac{x^2 - 5x + 6}{x - 3}$

D $j(x) = \dfrac{3x}{x^2 + x - 6}$

4. For each function, predict the location of any points of discontinuity, vertical asymptotes, and intercepts.

a) $f(x) = \frac{2x + 1}{x + 5}$

b) $f(x) = \frac{x^2 - 8x + 12}{x - 2}$

9.3 Connecting Graphs and Rational Equations, pages 314–320

5. Solve each rational equation algebraically.

a) $\frac{3}{x} - \frac{6}{x-2} = \frac{1}{4}$

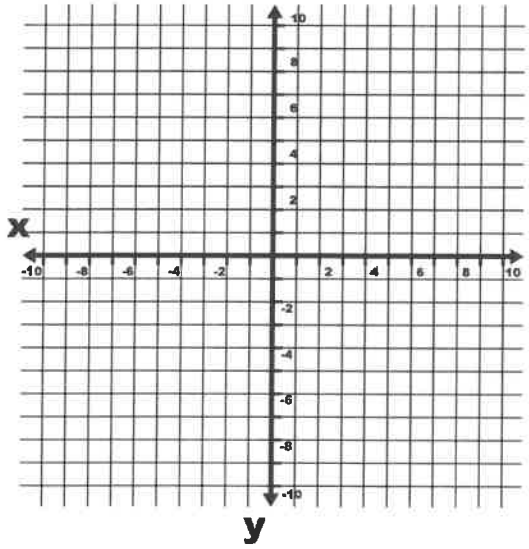
b) $\frac{x-2}{3} = \frac{2x-4}{x}$

c) $\frac{x+1}{x+3} = \frac{x+4}{x+5}$

b) $\frac{x+2}{x-2} = \frac{2x+4}{x+1}$

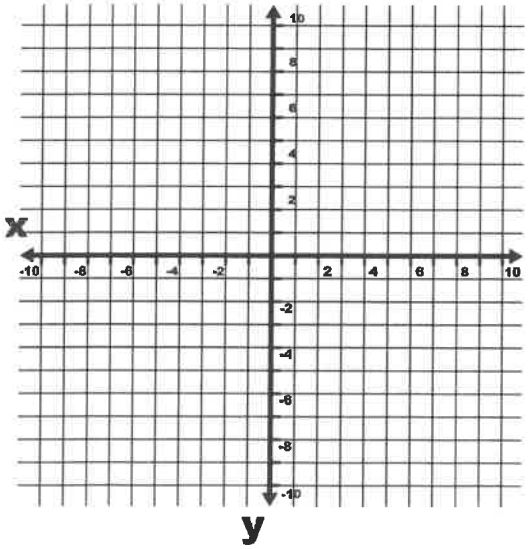
6 **a)** Determine an equation in the form $f(x) = \frac{ax+b}{cx+d}$ for a function that has asymptotes with equations $x = -1$ and $y = \frac{3}{4}$ and a y-intercept of 2.

b) Sketch the graph of your function.

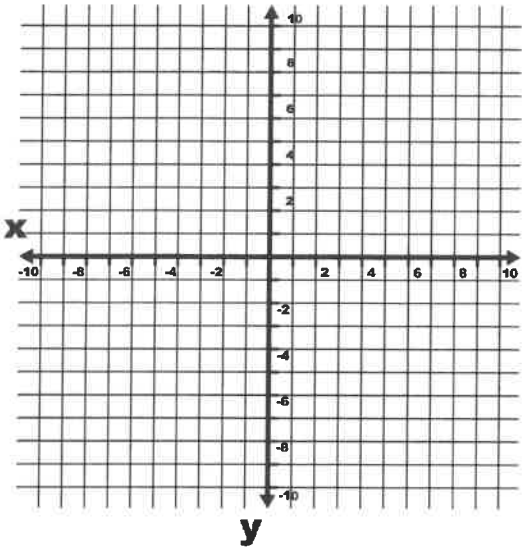


7. Solve graphically.

a) $x + 2 = \frac{2}{x+3}$



b) $\frac{2x}{x-2} = 2 - \frac{1}{2x+5}$



8. A ski club charters a bus for a ski trip at a cost of $480. In an attempt to lower the bus fare per skier, the club invites non-members to go along. After five non-members join the trip, the fare per skier decreases by $4.80. How many club members are going on the trip?