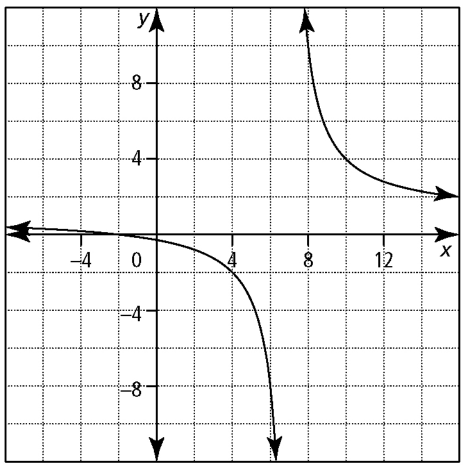
Name: ________________________________ Date: ______________________

BLM 9–3

Section 9.2 Extra Practice

1. Explain the behaviour at each non-permissible value in the graph of the rational function $y = \dfrac{x^2 + 5x + 6}{x^2 - 4x - 21}$.



2. Explain how the equation of the rational function $y = \dfrac{x + 2}{x^2 + 3x + 2}$ can be analysed to determine whether the graph of the function has an asymptote or a point of discontinuity.

3. Complete the table for the given rational function.

Characteristic	$y = \dfrac{(x + 3)(x - 2)}{(x + 5)(x + 3)}$
Non-permissible value(s)	
Feature exhibited at each non-permissible value	
Behaviour near each non-permissible value	
Domain	
Range	

4. Create a table of values for each function for values near its non-permissible value(s). Explain how your table shows whether a point of discontinuity or an asymptote occurs in each case.

a) $y = \dfrac{x^2 + 5x + 4}{x + 1}$ **b)** $y = \dfrac{x^2 + 5x - 14}{x^2 - 6x + 8}$

5. Analyse each function and predict the location of any vertical asymptotes, points of discontinuity, and intercepts. Then, graph the function to verify your predictions.

a) $y = \dfrac{x^2 + 5x}{x^2 + 7x + 10}$ **b)** $y = \dfrac{x^2 - 7x + 12}{x^2 - 9}$

c) $y = \dfrac{x^2 + 5x + 4}{x + 1}$ **d)** $y = \dfrac{2x^2 + 5x - 3}{x + 3}$

6. Complete the table and compare the behaviour of the two functions near any non-permissible values.

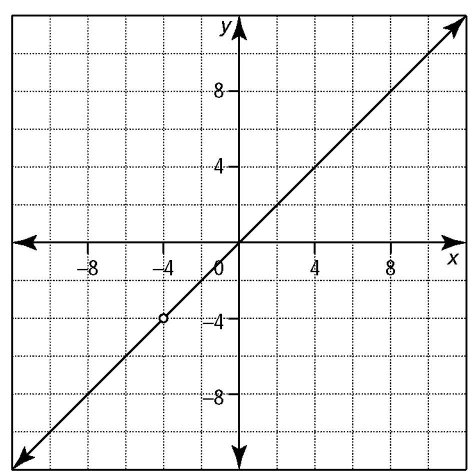
Characteristic	$y = \dfrac{x^2 - 3x}{3x - 9}$	$y = \dfrac{x^2 + 3x}{3x - 9}$
Non-permissible value(s)		
Feature exhibited at each non-permissible value		
Behaviour near each non-permissible value		

7. Without using technology, match the equation of each rational function with the most appropriate graph. Explain your reasoning.

a) $y = \dfrac{x + 4}{x^2 - 3x - 4}$ **b)** $y = \dfrac{x + 4}{x^2 + 5x + 4}$

c) $y = \dfrac{x^2 + 4x}{x + 4}$

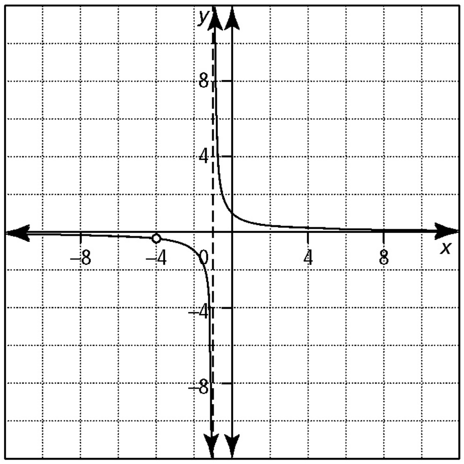
A



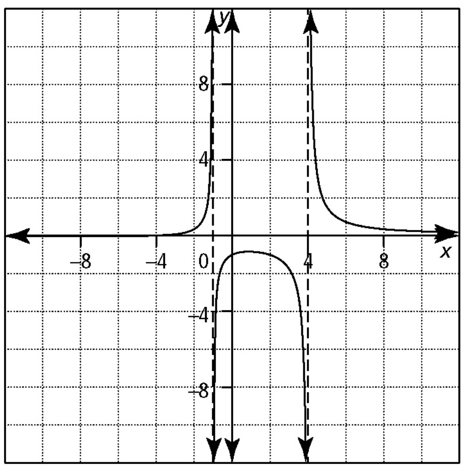
Name: ______________________________ Date: ______________________

BLM 9–3
(continued)

B

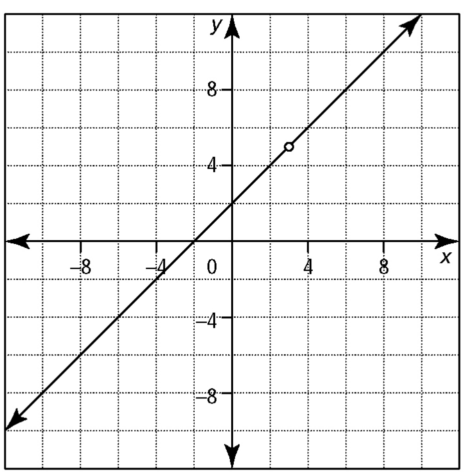


C

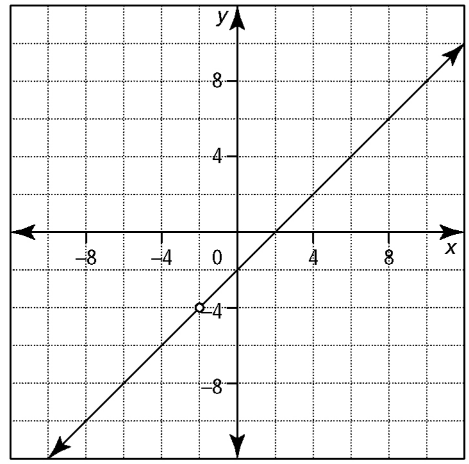


8. Write the equation for each graphed rational function.

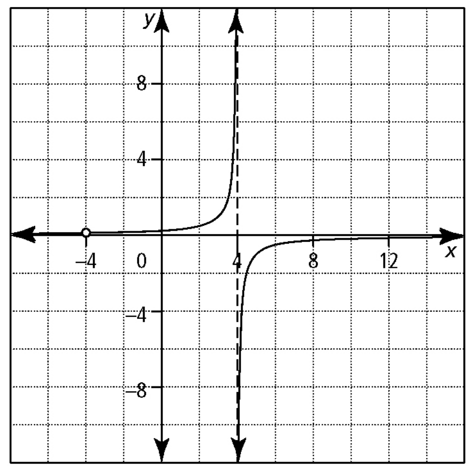
a)



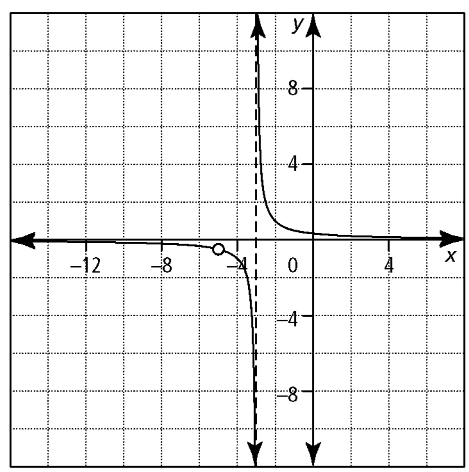
b)



c)



d)



9. Write the equation of a possible rational function that has an asymptote at $x = 2$, has a point of discontinuity at $x = -2.5$, and passes through $(6, -3)$.