

Extra Practice - Graphing Rational Functions

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Identify the holes, vertical asymptotes, and horizontal asymptote of each. Then sketch the graph.

1) $f(x) = \frac{x^3 + x^2 - 6x}{4x^2 + 4x - 8}$

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

3) $f(x) = \frac{-3x^2 - 12x - 9}{x^2 + 5x + 4}$

4) $f(x) = \frac{x^2 - 5x + 6}{-4x - 4}$

5) $f(x) = \frac{x^3 - 16x}{-3x^2 + 3x + 18}$

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

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

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

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

10) $f(x) = \frac{2x^3 - 2x^2}{x^3 - 9x}$

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

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

13) $f(x) = \frac{x^3 - 6x^2 + 8x}{-3x^2 + 9x - 6}$

14) $f(x) = \frac{x^2 + 4x + 3}{-3x - 6}$

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

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

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

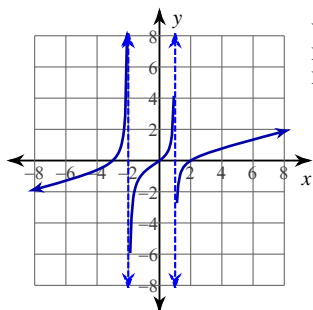
18) $f(x) = \frac{x^3 - 2x^2 - 3x}{4x^2 + 8x}$

19) $f(x) = \frac{x - 3}{-2x - 8}$

20) $f(x) = \frac{x^2 + 7x + 12}{-4x^2 - 8x + 12}$

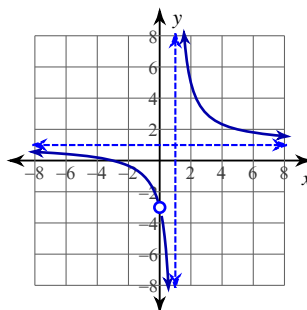
Answers to Extra Practice - Graphing Rational Functions

1)



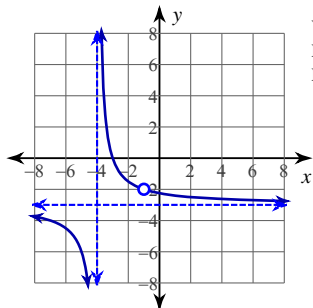
Vertical Asym.: $x = 1, x = -2$
 Holes: None
 Horz. Asym.: None

2)



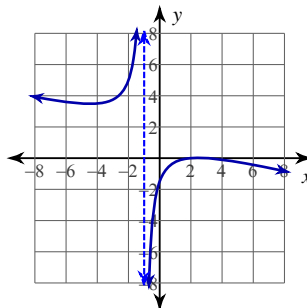
Vertical Asym.: $x = 1$
 Holes: $x = 0$
 Horz. Asym.: $y = 1$

3)



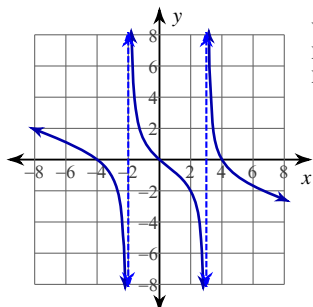
Vertical Asym.: $x = -4$
 Holes: $x = -1$
 Horz. Asym.: $y = -3$

4)



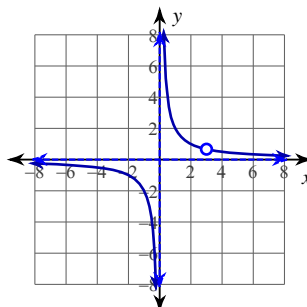
Vertical Asym.: $x = -1$
 Holes: None
 Horz. Asym.: None

5)



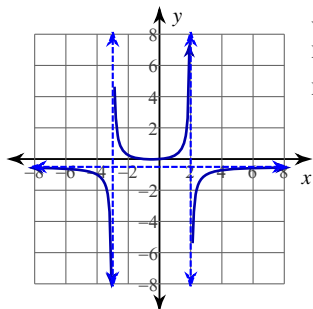
Vertical Asym.: $x = 3, x = -2$
 Holes: None
 Horz. Asym.: None

6)



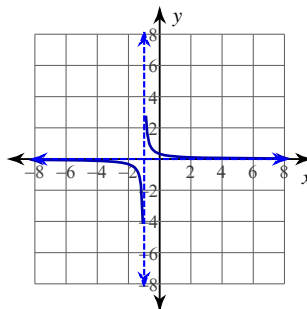
Vertical Asym.: $x = 0$
 Holes: $x = 3$
 Horz. Asym.: $y = 0$

7)



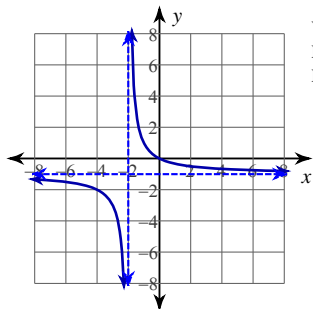
Vertical Asym.: $x = 2, x = -3$
 Holes: None
 Horz. Asym.: $y = -\frac{1}{2}$

8)



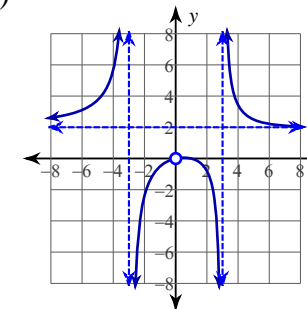
Vertical Asym.: $x = -1$
 Holes: None
 Horz. Asym.: $y = 0$

9)



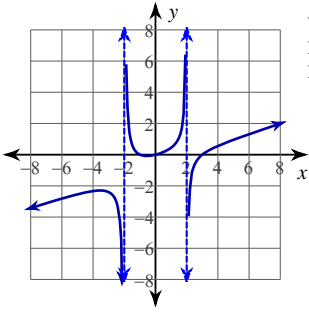
Vertical Asym.: $x = -2$
 Holes: None
 Horz. Asym.: $y = -1$

10)



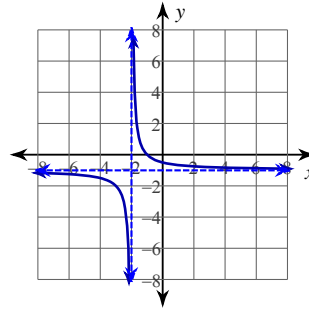
Vertical Asym.: $x = 3, x = -3$
 Holes: $x = 0$
 Horz. Asym.: $y = 2$

11)



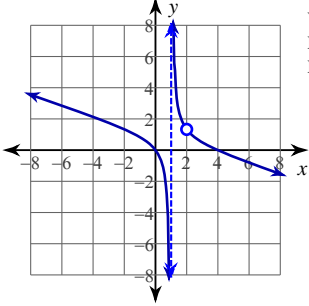
Vertical Asym.: $x = 2, x = -2$
 Holes: None
 Horz. Asym.: None

12)



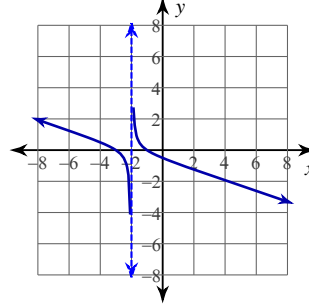
Vertical Asym.: $x = -2$
 Holes: None
 Horz. Asym.: $y = -1$

13)



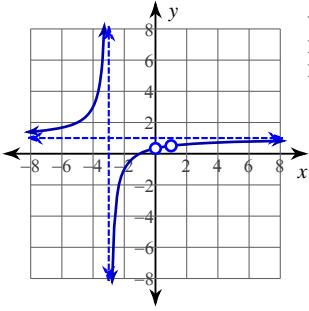
Vertical Asym.: $x = 1$
 Holes: $x = 2$
 Horz. Asym.: None

14)



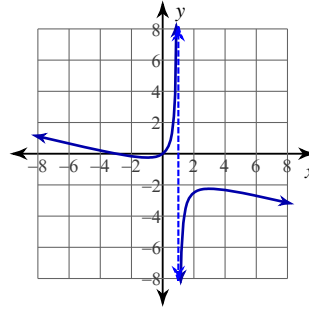
Vertical Asym.: $x = -2$
 Holes: None
 Horz. Asym.: None

15)



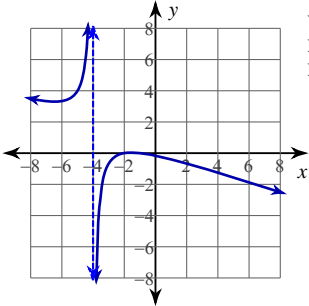
Vertical Asym.: $x = -3$
 Holes: $x = 0, x = 1$
 Horz. Asym.: $y = 1$

16)



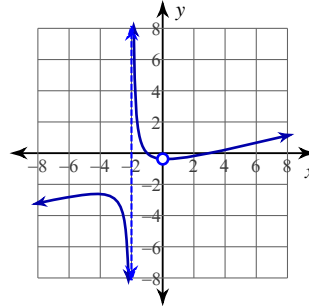
Vertical Asym.: $x = 1$
 Holes: None
 Horz. Asym.: None

17)



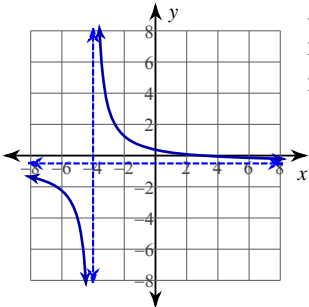
Vertical Asym.: $x = -4$
 Holes: None
 Horz. Asym.: None

18)



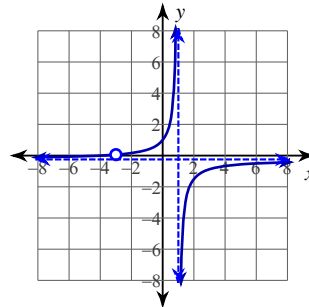
Vertical Asym.: $x = -2$
 Holes: $x = 0$
 Horz. Asym.: None

19)



Vertical Asym.: $x = -4$
 Holes: None
 Horz. Asym.: $y = -\frac{1}{2}$

20)



Vertical Asym.: $x = 1$
 Holes: $x = -3$
 Horz. Asym.: $y = -\frac{1}{4}$