

Graphing Rational Functions

Date _____ Period _____

Identify the points of discontinuity, holes, vertical asymptotes, x-intercepts, and horizontal asymptote of each.

1) $f(x) = \frac{1}{3x^2 + 3x - 18}$

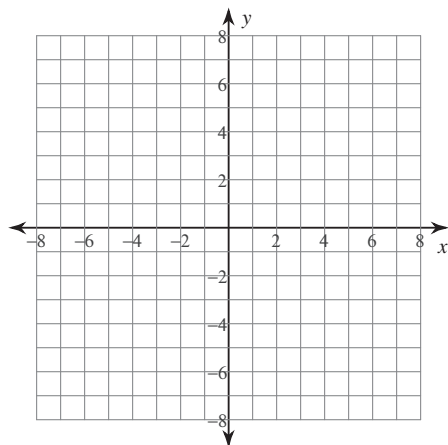
2) $f(x) = \frac{x - 2}{x - 4}$

3) $f(x) = \frac{x^3 - x^2 - 6x}{-3x^2 - 3x + 18}$

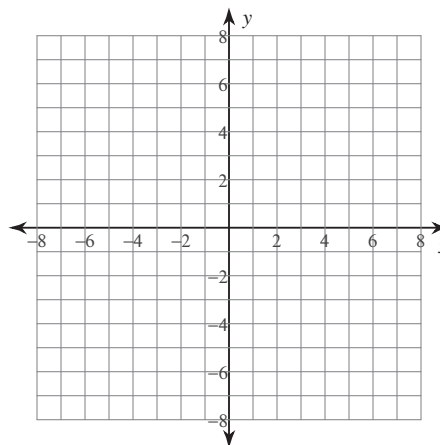
4) $f(x) = \frac{x^2 + x - 6}{-4x^2 - 16x - 12}$

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

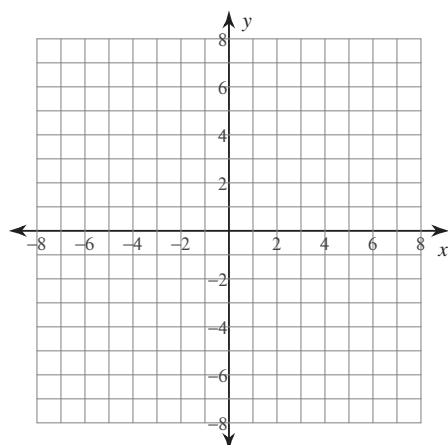
5) $f(x) = -\frac{4}{x^2 - 3x}$



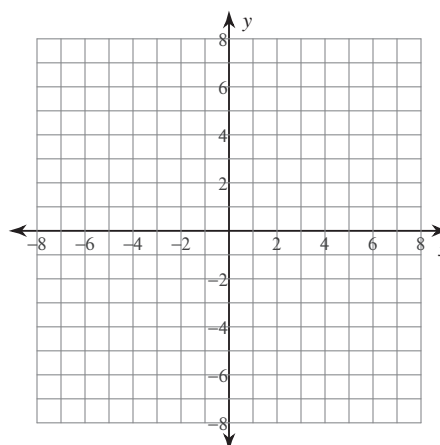
6) $f(x) = \frac{x - 4}{-4x - 16}$



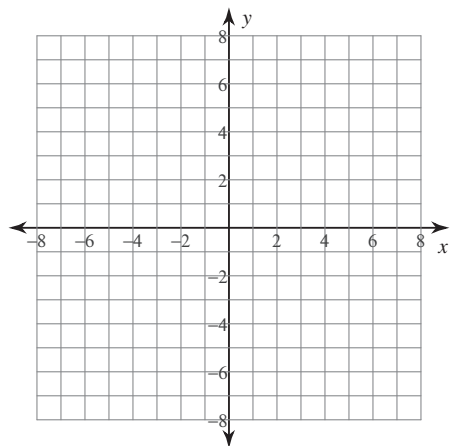
7) $f(x) = \frac{x + 4}{-2x - 6}$



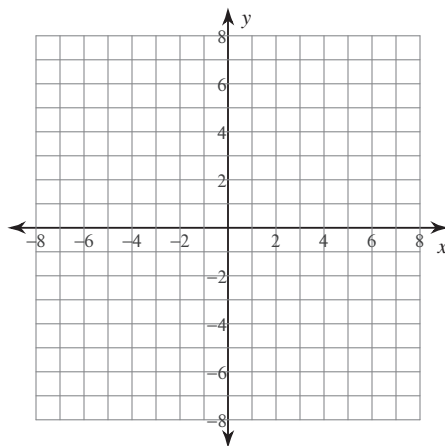
8) $f(x) = \frac{x^3 - 9x}{3x^2 - 6x - 9}$



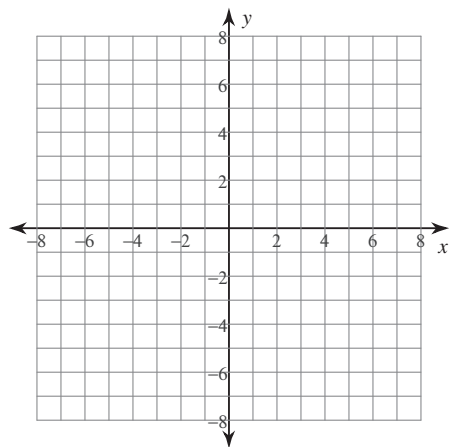
$$9) f(x) = \frac{3x^2 - 12x}{x^2 - 2x - 3}$$



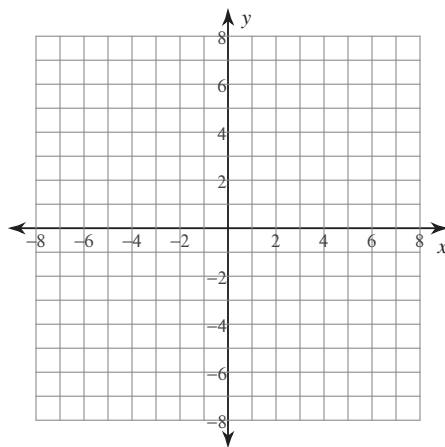
$$10) f(x) = \frac{x^3 - 16x}{-4x^2 + 4x + 24}$$



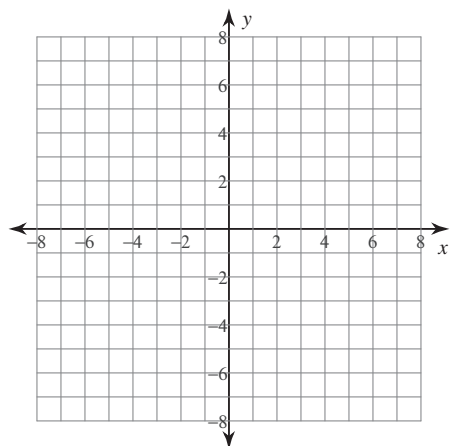
$$11) f(x) = \frac{x^2 + 2x}{-4x + 8}$$



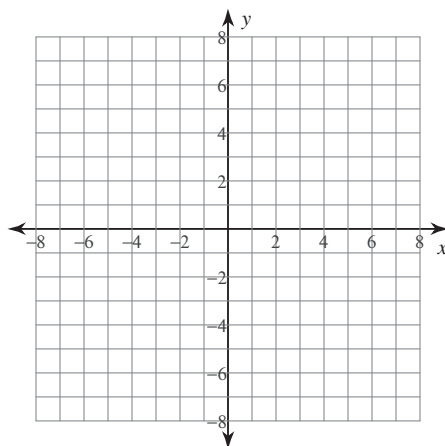
$$12) f(x) = \frac{x + 2}{2x + 6}$$



$$13) f(x) = \frac{2x^2 + 10x + 12}{x^2 + 3x + 2}$$



$$14) f(x) = \frac{3}{x - 2}$$



Graphing Rational Functions

Identify the points of discontinuity, holes, vertical asymptotes, x-intercepts, and horizontal asymptote of each.

1) $f(x) = \frac{1}{3x^2 + 3x - 18}$

Discontinuities: -3, 2
 Vertical Asym.: $x = -3, x = 2$
 Holes: None
 Horz. Asym.: $y = 0$
 X-intercepts: None

2) $f(x) = \frac{x - 2}{x - 4}$

Discontinuities: 4
 Vertical Asym.: $x = 4$
 Holes: None
 Horz. Asym.: $y = 1$
 X-intercepts: 2

3) $f(x) = \frac{x^3 - x^2 - 6x}{-3x^2 - 3x + 18}$

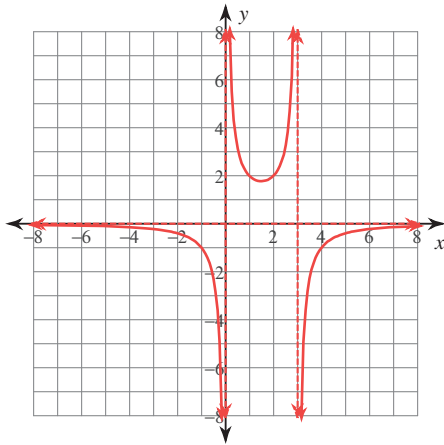
Discontinuities: 2, -3
 Vertical Asym.: $x = 2, x = -3$
 Holes: None
 Horz. Asym.: None
 X-intercepts: 0, -2, 3

4) $f(x) = \frac{x^2 + x - 6}{-4x^2 - 16x - 12}$

Discontinuities: -1, -3
 Vertical Asym.: $x = -1$
 Holes: $x = -3$
 Horz. Asym.: $y = -\frac{1}{4}$
 X-intercepts: 2

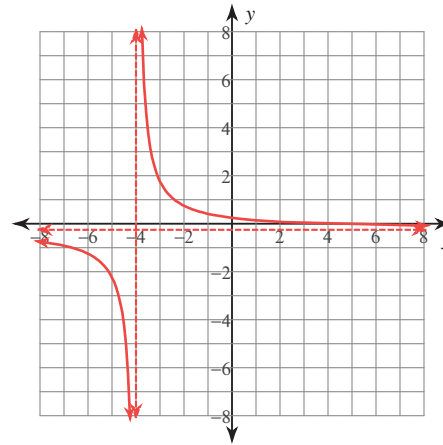
Identify the points of discontinuity, holes, vertical asymptotes, and horizontal asymptote of each. Then sketch the graph.

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



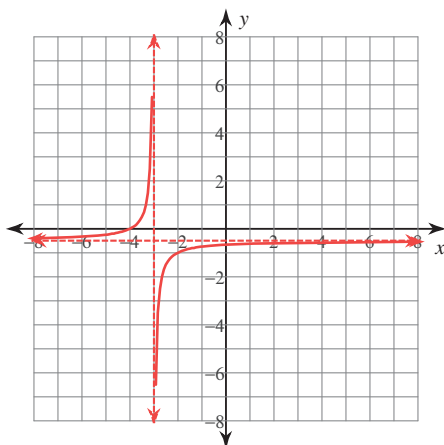
Discontinuities: 0, 3
 Vertical Asym.: $x = 0, x = 3$
 Holes: None
 Horz. Asym.: $y = 0$

6) $f(x) = \frac{x - 4}{-4x - 16}$



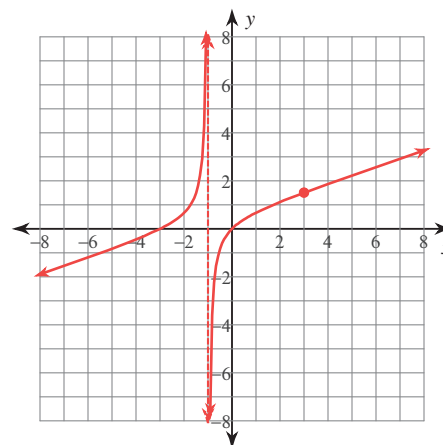
Discontinuities: -4
 Vertical Asym.: $x = -4$
 Holes: None
 Horz. Asym.: $y = -\frac{1}{4}$

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



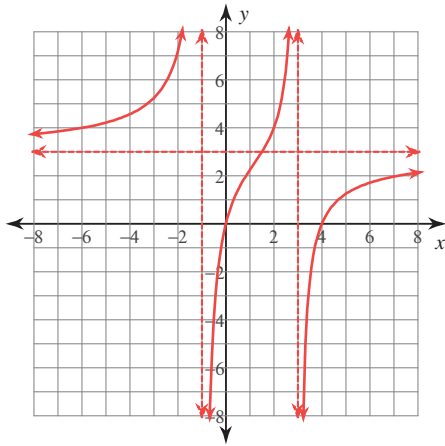
Discontinuities: -3
 Vertical Asym.: $x = -3$
 Holes: None
 Horz. Asym.: $y = -\frac{1}{2}$

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



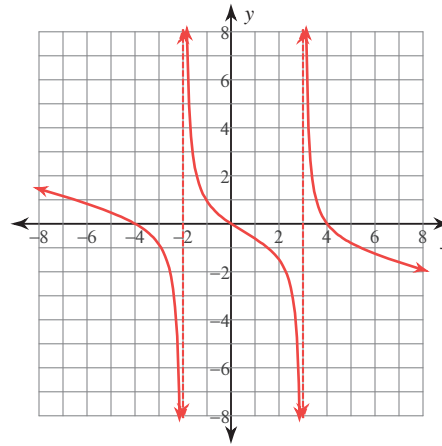
Discontinuities: -1, 3
 Vertical Asym.: $x = -1$
 Holes: $x = 3$
 Horz. Asym.: None

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



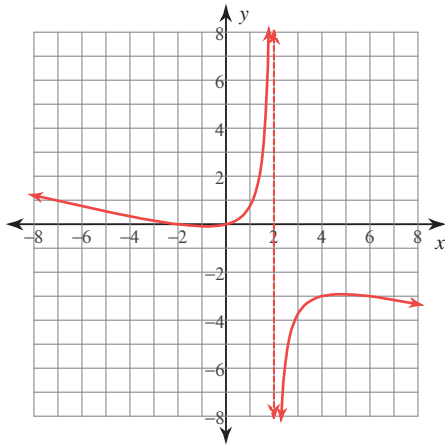
Discontinuities: -1, 3
Vertical Asym.: $x = -1, x = 3$
Holes: None
Horz. Asym.: $y = 3$

$$10) f(x) = \frac{x^3 - 16x}{-4x^2 + 4x + 24}$$



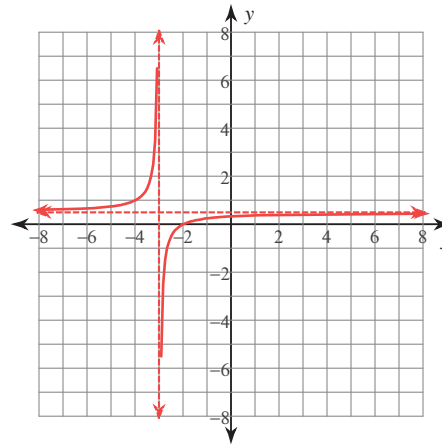
Discontinuities: 3, -2
Vertical Asym.: $x = 3, x = -2$
Holes: None
Horz. Asym.: None

$$11) f(x) = \frac{x^2 + 2x}{-4x + 8}$$



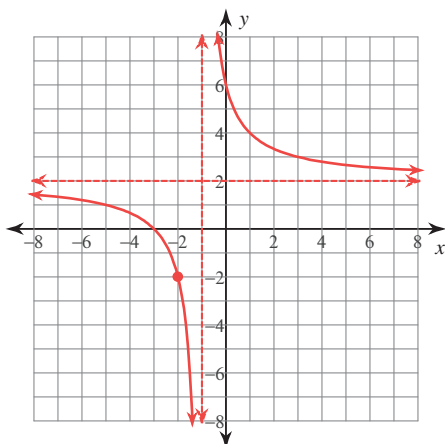
Discontinuities: 2
Vertical Asym.: $x = 2$
Holes: None
Horz. Asym.: None

$$12) f(x) = \frac{x + 2}{2x + 6}$$



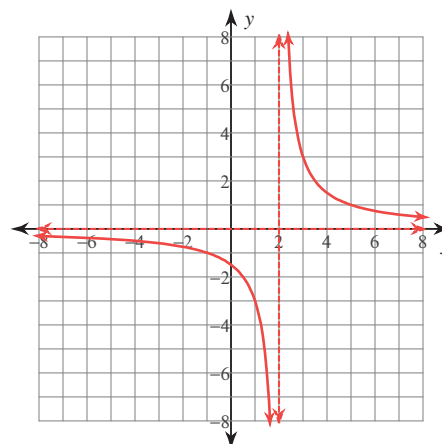
Discontinuities: -3
Vertical Asym.: $x = -3$
Holes: None
Horz. Asym.: $y = \frac{1}{2}$

$$13) f(x) = \frac{2x^2 + 10x + 12}{x^2 + 3x + 2}$$



Discontinuities: -1, -2
Vertical Asym.: $x = -1$
Holes: $x = -2$
Horz. Asym.: $y = 2$

$$14) f(x) = \frac{3}{x - 2}$$



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