Name_____

Assignment :Graphing Rational Functions

Date_____

Identify the points of discontinuity, holes, vertical asymptotes, x-intercepts, and horizontal asymptote of each.
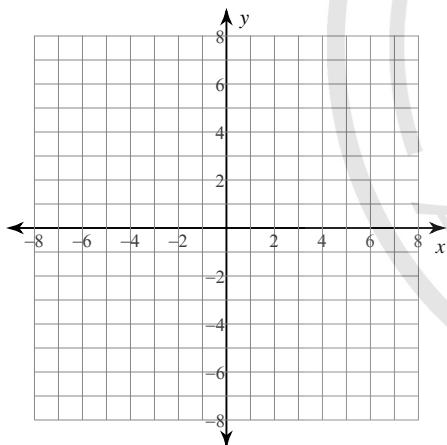
1) $f(x) = \dfrac{1}{3x^2 + 3x - 18}$

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

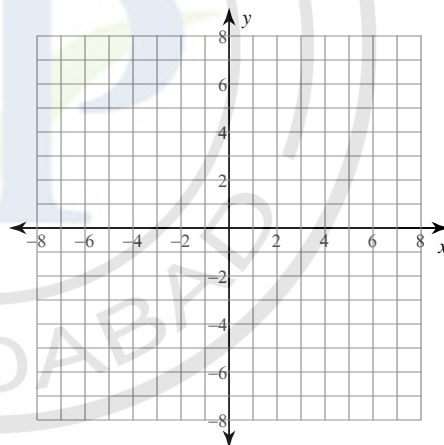3) $f(x) = \dfrac{x^3 - x^2 - 6x}{-3x^2 - 3x + 18}$

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

Identify the points of discontinuity, holes, vertical asymptotes, and horizontal asymptote of each. Then sketch the graph.
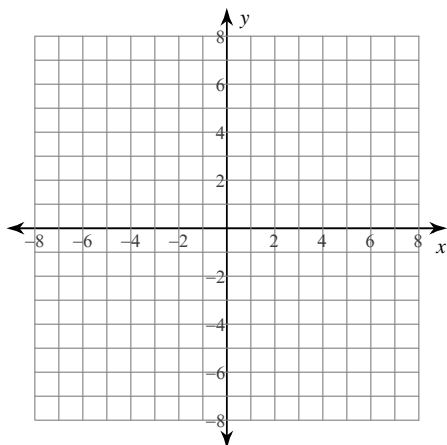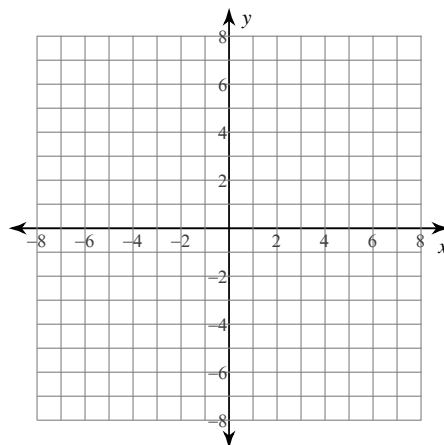
5) $f(x) = -\dfrac{4}{x^2 - 3x}$
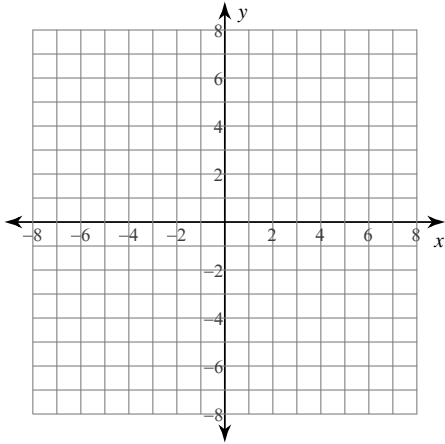

6) $f(x) = \dfrac{x - 4}{-4x - 16}$
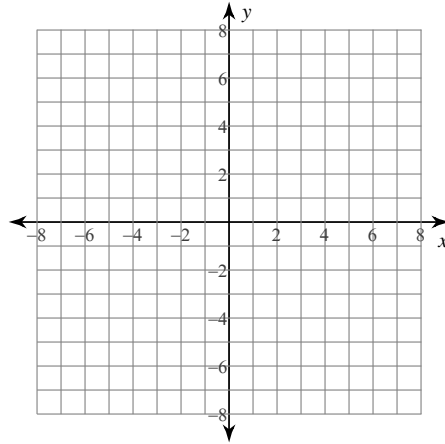

7) $f(x) = \dfrac{x + 4}{-2x - 6}$
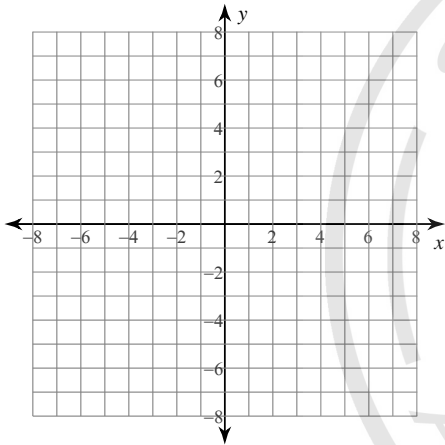

8) $f(x) = \dfrac{x^3 - 9x}{3x^2 - 6x - 9}$
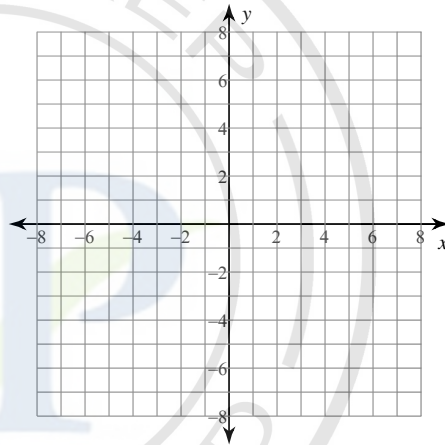
9) $f(x) = \dfrac{3x^2 - 12x}{x^2 - 2x - 3}$

10) $f(x) = \dfrac{x^3 - 16x}{-4x^2 + 4x + 24}$
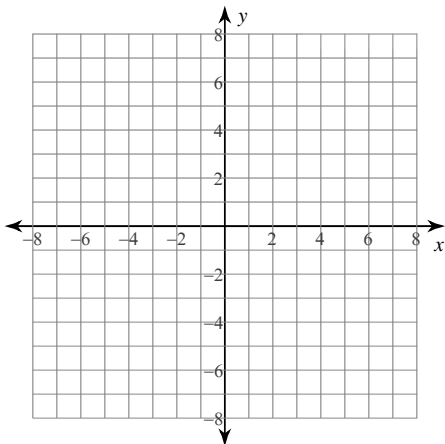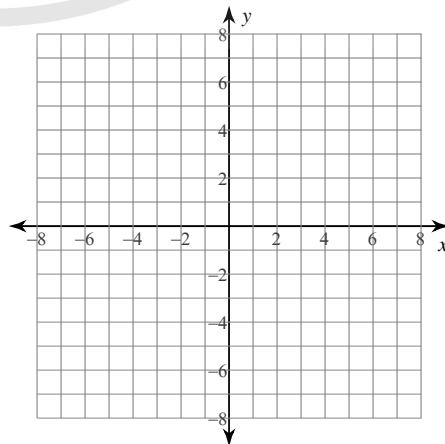
11) $f(x) = \dfrac{x^2 + 2x}{-4x + 8}$

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

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

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

Graphing Rational Functions

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

1) $f(x) = \dfrac{1}{3x^2 + 3x - 18}$ 　Discontinuities: –3, 2
Vertical Asym.: $x = -3$, $x = 2$
Holes: None
Horz. Asym.: $y = 0$
X-intercepts: None

2) $f(x) = \dfrac{x - 2}{x - 4}$ 　Discontinuities: 4
Vertical Asym.: $x = 4$
Holes: None
Horz. Asym.: $y = 1$
X-intercepts: 2
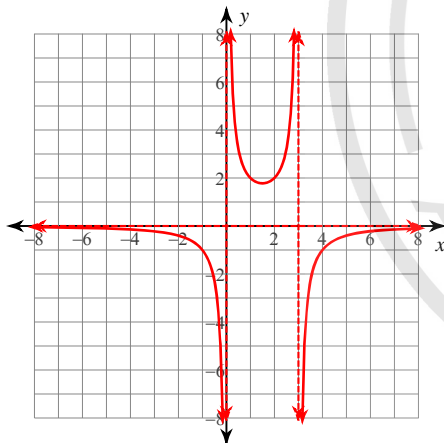
3) $f(x) = \dfrac{x^3 - x^2 - 6x}{-3x^2 - 3x + 18}$ 　Discontinuities: 2, –3
Vertical Asym.: $x = 2$, $x = -3$
Holes: None
Horz. Asym.: None
X-intercepts: 0, –2, 3

4) $f(x) = \dfrac{x^2 + x - 6}{-4x^2 - 16x - 12}$ 　Discontinuities: –1, –3
Vertical Asym.: $x = -1$
Holes: $x = -3$
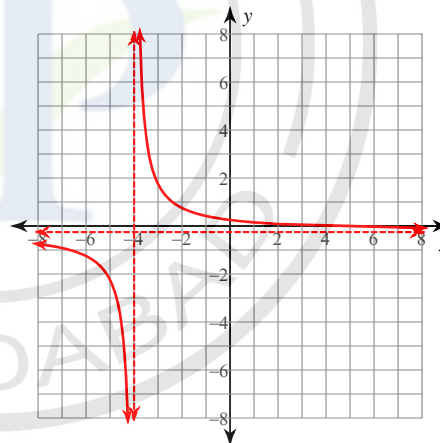Horz. Asym.: $y = -\dfrac{1}{4}$
X-intercepts: 2

Identify the points of discontinuity, holes, vertical asymptotes, and horizontal asymptote of each. Then sketch the graph.
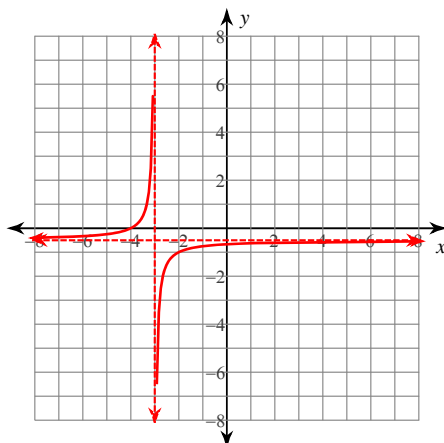
5) $f(x) = -\dfrac{4}{x^2 - 3x}$

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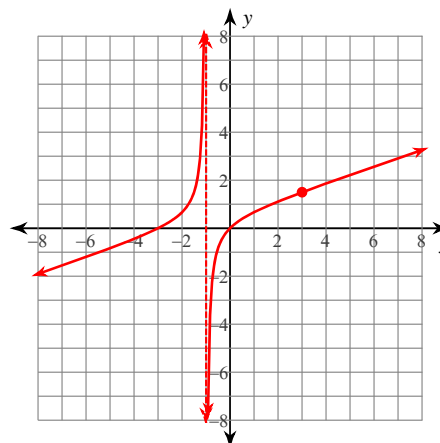Horz. Asym.: $y = 0$

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

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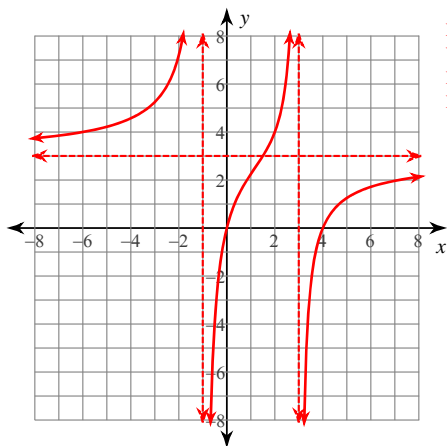Horz. Asym.: $y = -\dfrac{1}{4}$

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

Discontinuities: –3
Vertical Asym.: $x = -3$
Holes: None
Horz. Asym.: $y = -\dfrac{1}{2}$
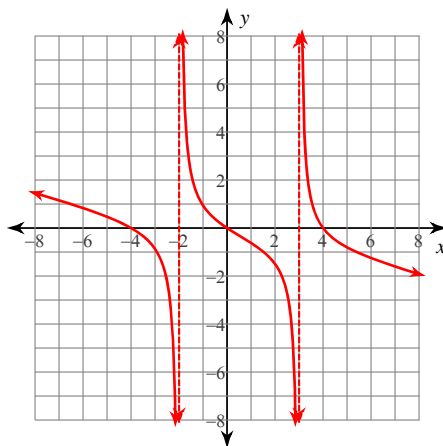
8) $f(x) = \dfrac{x^3 - 9x}{3x^2 - 6x - 9}$

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

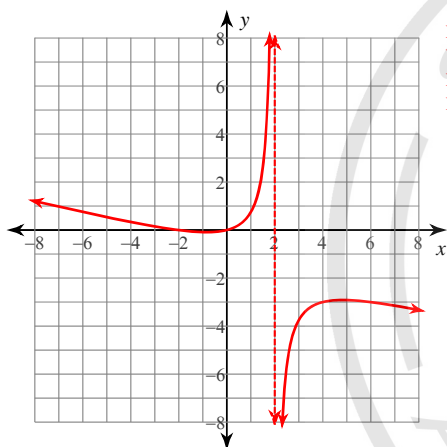9) $f(x) = \dfrac{3x^2 - 12x}{x^2 - 2x - 3}$

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

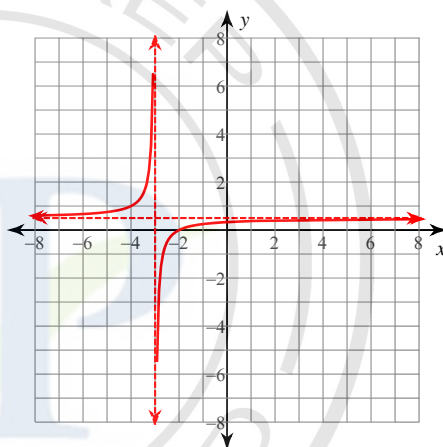10) $f(x) = \dfrac{x^3 - 16x}{-4x^2 + 4x + 24}$

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

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

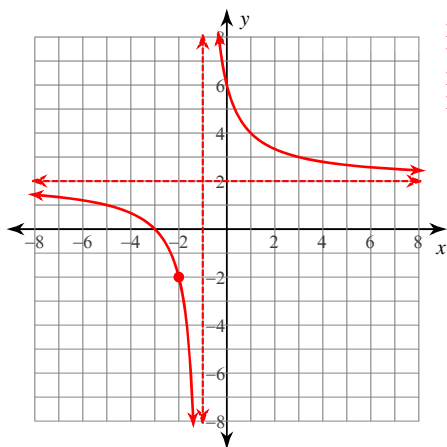Discontinuities: 2
Vertical Asym.: $x = 2$
Holes: None
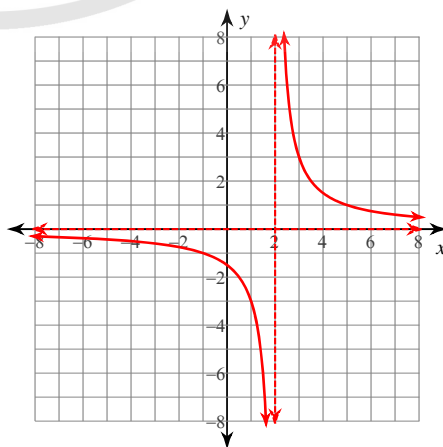Horz. Asym.: None

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

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

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

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

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

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

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