

Simplifying and Graphing Rational Expressions

 **Simplify.**

1) $\frac{x+3}{3x+9} =$

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

3) $\frac{16}{4x-4} =$

4) $\frac{36x^3}{42x^3} =$

5) $\frac{x^2 - 3x - 4}{x^2 + 2x - 24} =$

6) $\frac{81x^3}{18x} =$

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

8) $\frac{x^2 - 3x - 28}{x-7} =$

9) $\frac{6x+18}{30} =$

10) $\frac{16}{4x-4} =$

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

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

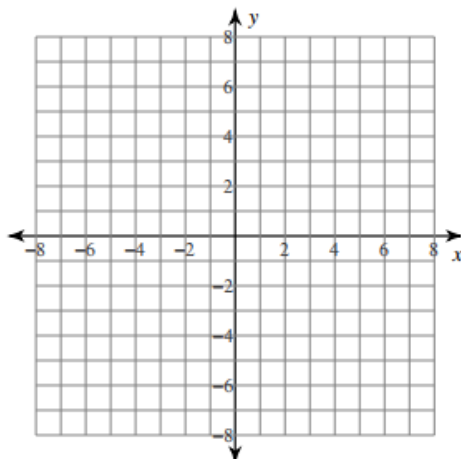
13) $f(x) = \frac{x-2}{x-4} =$

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

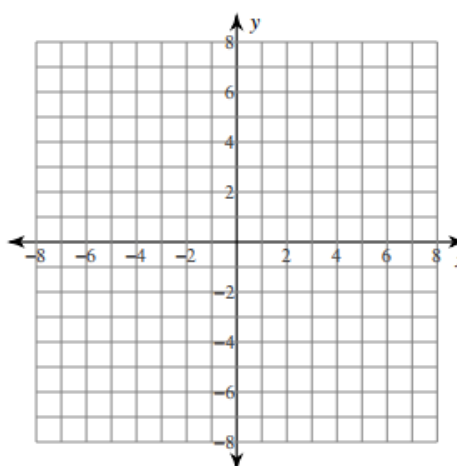
14) $f(x) = \frac{1}{3x^2 + 3x - 18} =$

 **Graph rational expressions.**

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



16) $f(x) = \frac{4x^3 - 16x + 64}{x^2 - 2x - 4}$



Answers

Simplifying and Graphing rational expressions

1) $\frac{1}{3}$

2) $2(x - 3)(x + 2)$

3) $\frac{4}{x - 1}$

4) $\frac{6}{7}$

5) $\frac{x + 1}{x + 6}$

 11) Discontinuities: $-3, 2$

 Vertical Asym: $x = -3, x = 2$

Holes: None

Horz. Asym: None

 X-intercepts: $0, -2, 3$

 12) Discontinuities: $-1, -3$

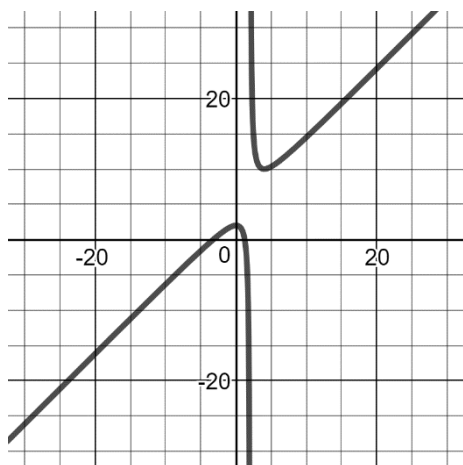
 Vertical Asym: $x = -1$

 Holes: $x = -3$

 Horz. Asym: $y = -\frac{1}{4}$

 X-intercepts: 2

15)



6) $\frac{9x^2}{2}$

7) $\frac{x + 3}{5}$

8) $x + 4$

9) $\frac{x + 3}{8}$

10) $\frac{4}{x - 1}$

 13) Discontinuities: 4

 Vertical Asym: $x = 4$

Holes: None

 Horz. Asym: $y = 1$

 X-intercepts: 2

 14) Discontinuities: $-3, 2$

 Vertical Asym: $x = -3, x = 2$

Holes: None

 Horz. Asym: $y = 0$

X-intercepts: None

16)

