

Work on as many problems as you can together with your group members. Towards the end of lecture your group will be asked to present problems correctly to receive classwork points.

1. Find the vertical asymptotes, if any, and the values of x corresponding to holes, if any, of the graph of the rational function.

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

(b) $f(x) = \frac{x^2 - 36}{x - 6}$

(c) $f(x) = \frac{x}{x(x-1)}$

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

(e) $f(x) = \frac{x(x-1)}{x^2 - 1}$

2. Find the horizontal asymptote, if any, of the graph of the rational function.

(a) $f(x) = \frac{3x^2 - 5}{x(x-1)}$

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

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

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

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

3. Graph the following rational function using transformations.

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

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

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

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

(e) $f(x) = \frac{1}{x-3} - 1$

4. Graph the rational function. Identify the vertical and horizontal asymptotes, if any. Plot the x and y intercepts.

$$(a) f(x) = \frac{2x^2 + 3x - 5}{2x^2 - 7x}$$

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

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

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

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