# Math Lab: Graphing Rational Functions

These notes are intended as a summary of section 2.2 (p. 100 – 103) in your workbook. You should also read the section for more complete explanations and additional examples.

Group 1
For each of the following functions,

- sketch a graph of the function
- identify any vertical asymptotes
- identify any horizontal asymptotes
- identify any non-permissible values of x

a) $y = \dfrac{x^2 - 1}{x + 1}$
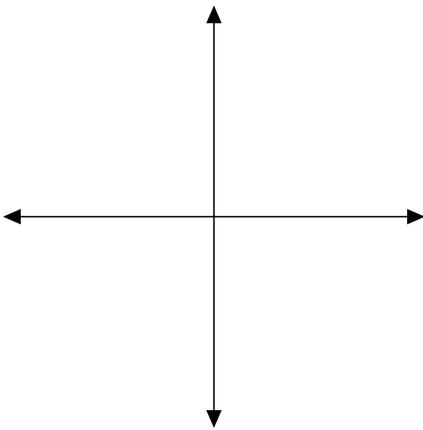
Vertical Asymptote   _____

Horizontal Asymptote   _____

Non-permissible values of x _____

b) $y = \dfrac{x^2 + x - 2}{x + 2}$
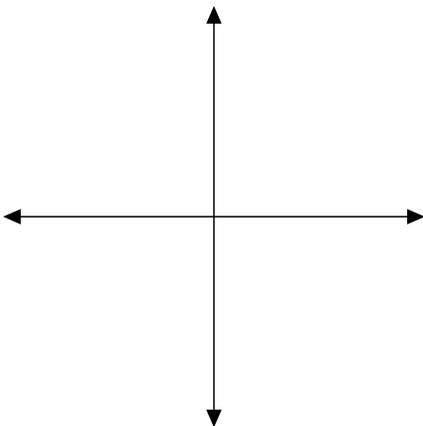
Vertical Asymptote   _____

Horizontal Asymptote   _____

Non-permissible values of x _____

c) $y = \dfrac{x^2}{x-1}$
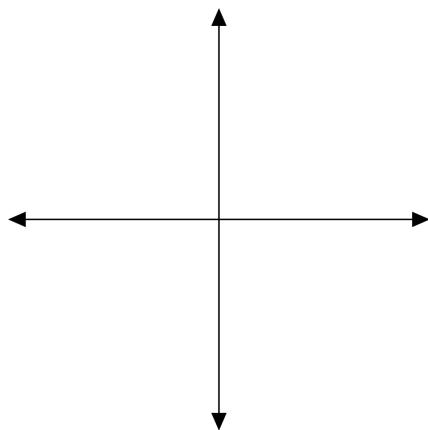
Vertical Asymptote _____

Horizontal Asymptote _____

Non-permissible values of x _____

d) $y = \dfrac{x^2 + 2x + 1}{x+2}$
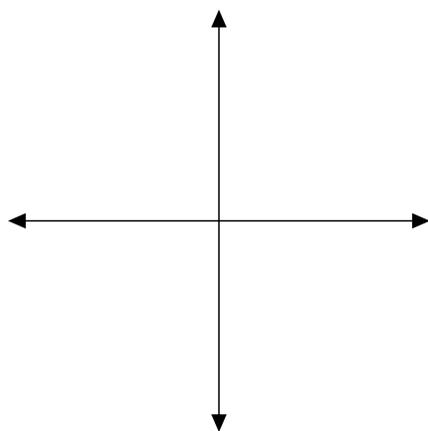
Vertical Asymptote _____

Horizontal Asymptote _____

Non-permissible values of x _____

e) $y = \dfrac{2x^2 - 4x}{x - 2}$
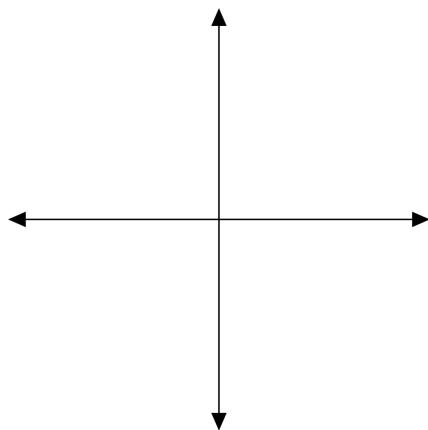
Vertical Asymptote _____

Horizontal Asymptote _____

Non-permissible values of x _____

Group 2

For each of the following functions,

- sketch a graph of the function
- identify any vertical asymptotes
- identify any horizontal asymptotes
- identify any non-permissible values of x

a) $y = \dfrac{3x}{x - 1}$
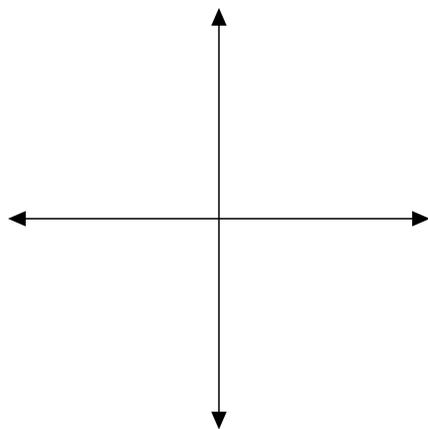
Vertical Asymptote _____

Horizontal Asymptote _____

Non-permissible values of x _____

b) $y = \dfrac{x^2 - 1}{x^2 - 4}$
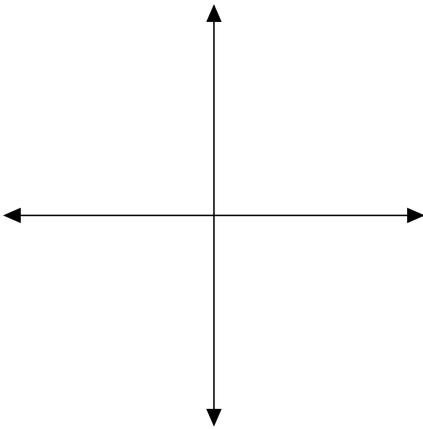
Vertical Asymptote _____

Horizontal Asymptote _____

Non-permissible values of x _____

c) $y = \dfrac{-2x + 4}{x - 1}$
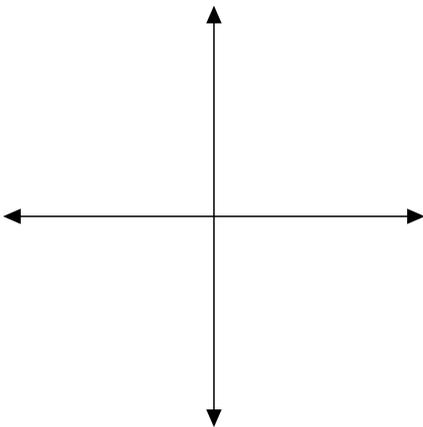
Vertical Asymptote _____

Horizontal Asymptote _____

Non-permissible values of x _____

Group 3
For each of the following functions,

- sketch a graph of the function
- identify any vertical asymptotes
- identify any horizontal asymptotes
- identify any non-permissible values of x

a) $y = \dfrac{6}{x^2 + 2}$
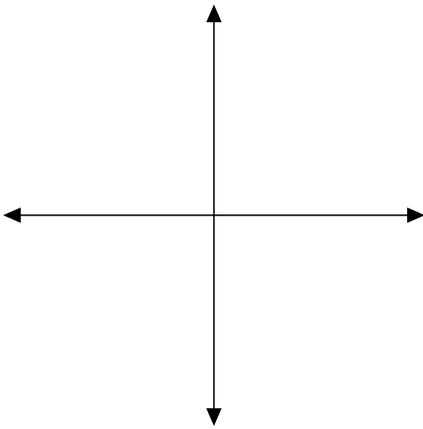
Vertical Asymptote   _____

Horizontal Asymptote   _____

Non-permissible values of x _____

b) $y = \dfrac{2}{-x^2 + 2x + 3}$
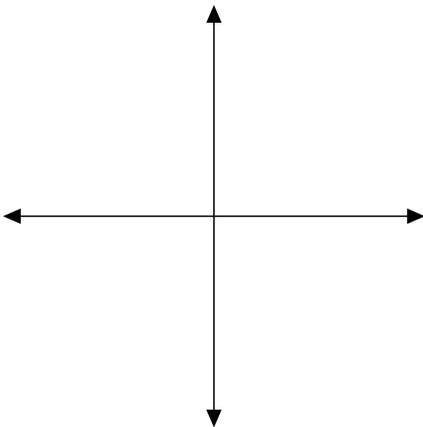
Vertical Asymptote   _____

Horizontal Asymptote   _____

Non-permissible values of x _____

c) $y = \dfrac{4}{x^2}$
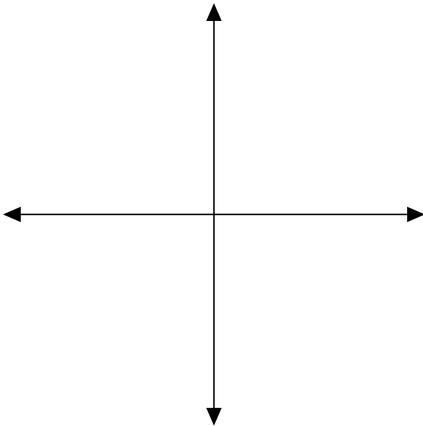
Vertical Asymptote   _____

Horizontal Asymptote   _____

Non-permissible values of x _____

d) $y = \dfrac{2x}{x^2}$
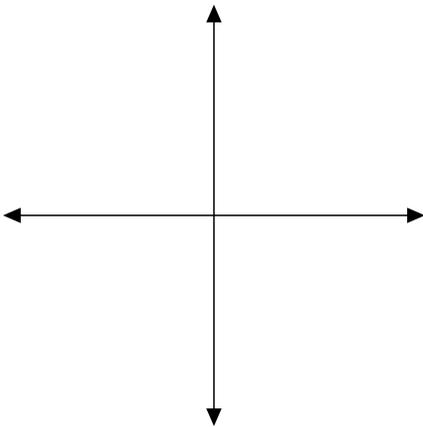
Vertical Asymptote   _____

Horizontal Asymptote   _____

Non-permissible values of x _____

e) $y = \dfrac{4x}{x^2 + 1}$
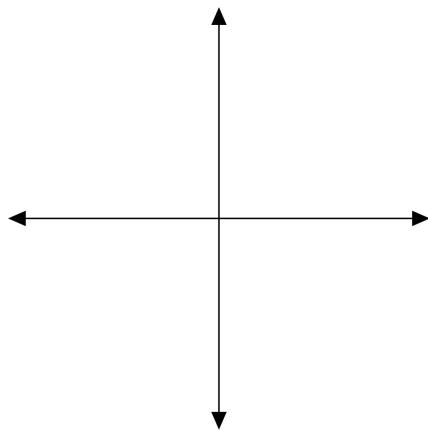
Vertical Asymptote   _____

Horizontal Asymptote   _____

Non-permissible values of x _____

Questions

1. All the functions above are known as rational functions. Do you think this name is appropriate? Why?

2. For a rational function, how can you determine the non-permissible values of x from its graph?

3. From the equation of a rational function, how can you tell whether its graph has an asymptote or a hole at a non-permissible value of x?

4. From the equation of a rational function, how can you tell whether its graph has a horizontal asymptote?

Homework: #1 – 4 in the Assess Your Understanding of section 2.2 (p. 104). Answers on p. 104.

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