

Chapter 11 – Section 11.4 Rational Functions

TICKET-IN-THE-DOOR

In order to be prepared for class you must watch the module and complete the following activity. This is due first thing when you get to class.

Define a **rational** function

Check your understanding:

1. Which of the following are **rational** functions? Explain.

A) $y = \frac{x^2 - 2}{x^5} - \frac{1}{2x^2}$

B) $y = \frac{2^x - 5}{4^x}$

C) $y = \frac{2\sqrt{x} + 5}{x^4 - 2}$

2. Find the **long-run behavior** of the function $y = \frac{x^2 - 3}{x^3} - \frac{1}{5x^2}$. (*Hint: Find a common denominator*)

3. Determine the **vertical** and **horizontal** asymptotes, if they exist, of the function below. (*Hint: Combine the three fractions to obtain a common denominator and work out the algebra!*)

$$y = 6 - \frac{14}{4x + 36} + \frac{1}{5x^4}$$

4. The profit earned by a producer to manufacture and sell n units of a good is given by

$$P(n) = 11n - 2343. \text{ The average profit for } n \text{ units is given by } A(n) = \frac{P(n)}{n}.$$

- Compute $A(1)$, $A(213)$, $A(280)$.
- In practical terms what do the values in part a mean?
- What trend do you notice in the values of $A(n)$ as n gets large?