

## Pathways Reading Guide M5 Section 3

Please read Module 5, section 1 in your e-book, pp. 21 – 30. (Click on Module 5, then “text.”)

Be sure to *read with a pencil in hand* and attempt the examples before you read the solution given. Take notes of important definitions and ideas as you read. I don't expect you to have 100% comprehension of everything in the section, but spending significant time trying to understand the main ideas will assist you as you work on the Investigation during our next class.

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Give an example of a monomial expression.

What is the difference between a polynomial expression and a polynomial function?

Create function rule for a fourth degree polynomial and identify the leading term.

Do the same for a cubic polynomial and put it in standard form.

Which of the following are polynomial functions?

- $y = 3^x$
- $y = 10$
- $y = 7^{-3} + 4x^2 + 1$
- $y = 5x^4 - 8x^3 - x + 2$
- $y = \frac{5}{x} + 3x - 8$

Study Example 14 on p. 23. What happens to the outputs of the function if you throw the ball from a building that is 5 feet higher than the original? How do the graphs of the two functions compare?

Give a real-world example of a **horizontal shift** of a function.

How is the function rule for a vertical shift of the original function  $f$  different than the function rule for a horizontal shift?

Suppose the function  $f$  is given by  $f(x) = x^2$ . Identify each of the shifts indicated in the function rules below: vertical (up or down) or horizontal (right or left) or both.

- $f(x) = x^2 + 10$
- $f(x) = (x + 10)^2$
- $f(x) = (x - 6)^2$
- $f(x) = x^2 - 7$
- $f(x) = (x - 3)^2 + 8$

When does a vertical stretch of a graph of a function occur? Give a function rule  $g$  for a vertical stretch of the function  $f$  given by  $f(x) = x^2$ .

Give a function rule  $g$  for a vertical compression of the function  $f$  given by  $f(x) = x^2$ .