

LESSON 3.4 Assignment

Name _____ Date _____

Polynomial DNA**Key Characteristics of Polynomial Functions**

1. Julio has been tracking the stock price of Computer Dudes, Inc. over the 40 days since it started trading on the New York Stock Exchange. He models the stock price over the 40 days with the function $p(x) = -0.000083x^4 + 0.0069x^3 - 0.165x^2 + x + 3.70$, where $p(x)$ represents the stock price, in dollars, on the x th day since the stock started trading.
 - a. Graph the function $p(x)$ on your graphing calculator and view the graph using the following window settings: Xmin = 0, Xmax = 40, Xscl = 5, Ymin = -1, Ymax = 10, Yscl = 1, and Xres = 1. Is each of the extrema for the graph of $p(x)$ visible in this window? Explain how you know.
 - b. Determine the domain and range of $p(x)$.
 - c. Explain what the domain and range mean in the context of the problem. Then, determine the domain and range of $p(x)$ in terms of the problem situation.
 - d. Determine the y -intercept of the graph of $p(x)$. Then, describe the meaning of the y -intercept in the context of the problem.
 - e. Determine the x -intercepts of the graph of $p(x)$. Include only the x -intercepts that are in the domain of the problem situation. Then, describe the meaning of the x -intercepts in the context of the problem.

3

LESSON 3.4 Assignment

page 2

- f. Determine the intervals over which the function is increasing and decreasing. Include only the intervals within the context of the problem. Explain how these intervals relate to the problem situation.

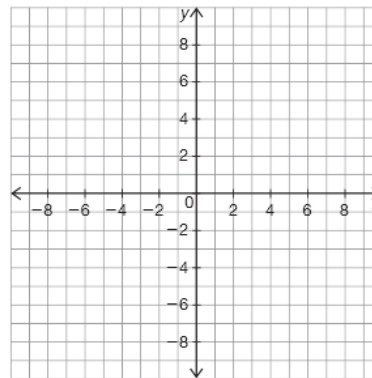
- g. At what point during the 40 days since the stock started trading did the price of the stock reach a maximum? What was the maximum price at that point? Explain your reasoning.

- h. On the 40th day since the stock started trading, Julio analyzes his model and tries to decide whether to buy stock in Computer Dudes, Inc. Based on his model, should Julio buy the stock?

- i. Do you think the function $p(x)$ will effectively model the stock price beyond the 40th day?

3

- 2. Sketch the graph of $f(x) = \frac{1}{2}(x - 1)(x - 3)(x + 2)^2$ without the use of a calculator. Explain how you graphed the function.



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