

Calculus H
Ch. 3 #2

Name _____

1. Let $f(x) = -x^3 + 12x + 25$

- a. Plot the graphs of $f(x)$ and $f'(x)$ on the same screen. Adjust your window so that you can see both.
- b. For what values of x is $f'(x)$ positive? What is the graph of $f(x)$ doing for these values of x ?
- c. For what values of x is $f(x)$ decreasing? What is true about $f'(x)$ for these values of x ?
- d. What does the graph of $f(x)$ do at values of x where the $f'(x)$ graph crosses the x -axis?
- e. Make a conjecture about what type of function $f'(x)$ is.

2. Let $h(x) = x^4 - 2x^3 - 9x^2 + 20x + 80$

- a. Plot the graphs of $h(x)$ and $h'(x)$ on the same screen. Adjust your window so that you can see both.
- b. What type of function has a graph that is the same shape as the graph of $h'(x)$? Make a conjecture about what type of function the derivative of a seventh-degree function would be.
- c. What are the zeros of $h'(x)$?
- d. What features does the graph of $h(x)$ have if $h'(x) = 0$? Based on the meaning of derivative, explain why this observation is reasonable.