- 1. Let f(x) = -4x + 5.
  - a. What is the slope of the line f(x)?
  - b. Find the derivative equation for f(x).

- c. How do your answers to (a) and (b) compare? Why?
- 2. A graph for the function  $f(x) = -x^2 + 8x 12$  is shown. a. Where is the slope of f(x) equal to 0?
  - b. Find the derivative equation for f(x), denoted f'(x).



- c. Find where the derivative equation you obtained in part (b) equals 0. How does it compare to your answer to part (a)? Explain.
- d. Find f'(2) and explain why the value is what it is.
- e. Find f'(5) and explain why the value is what it is.

f'(x) = 0 always	f'(x) > 0 always
f'(x) < 0 always and $f'(x)$ is not constant	f'(x) < 0 for $x < 2$ and $f'(x) > 0$ for $x > 2$

3. Sketch a graph of f(x) for each situation that satisfies the statement about its derivative, f'(x).

- 4. The graph for  $f(x) = \sin x$  is shown.
  - a. Go to <u>tinyurl.com/graph123321</u> and use the Desmos applet to determine what the slope of  $f(x) = \sin x$  is at each point given in the table and record your value in the table.



- b. Plot the points from the table on the blank graph above, letting the slope value be the ycoordinate of the point. So, for example, the first point you would plot should be (0, 1).
- c. Sketch in what the graph for the derivative function (slope function) for  $f(x) = \sin x$  will be. What function is it? Is that surprising to you?