Essentials of Calculus Homework 2.2 The derivative function

- 1. Let $f(x) = 2x^2$. Approximate the following values.
 - a) f'(−1).
 b) f'(0).
 - c) f'(1).
 - d) f'(2).
- 2. Let f(x) be the function with the following graph.



- a) Draw the tangent lines to the graph at x = -1, 0, 1.
- b) Approximate f'(-1), f'(0), f'(1).
- c) Sketch the graph of f'.
- 3. For the functions given by the following graphs, sketch the graph of the derivative.





4. Match the graphs of the functions ((a)-(d)) with the graphs of their derivatives (I-IV).







- 5. For each of the following, sketch the graph of a function which matches the description.
 - a) f'(x) > 0 for x < 0, f'(0) = 0, f'(x) < 0 for 0 < x < 2, f'(2) = 0f'(x) > 0 for x > 2.
 - b) f'(x) < 0 for x < 1, f'(1) = 0 f'(x) > 0 for 1 < x < 1.5, f'(1.5) = 0, f'(x) < 0 for 1.5 < x < 3, f'(3) = 0, f'(x) > 0 for x > 3.
 - c) f'(x) > 0 for x < 0, f'(0) = 0 f'(x) > 0 for 0 < x < 1, f'(1) = 0f'(x) > 0 for x > 1.
 - d) f'(x) > 0 for x < 0, f'(0) = 0, f'(x) > 0 for 0 < x < 1, f'(1) = 0, f'(x) < 0 for 1 < x < 3, f'(3) = 0, f'(x) < 0 for x > 3.