Name:
Section 2.2 & 2.3 - In class examples
Math 151 – Spring 2018
Section 2.2

1. Find approximate values for $f'(5)$ and $f'(15)$.

x	0	5	10	15	20
$f(x)$	100	70	55	46	40

$$f'(5) \approx \frac{-6.0 + -3.0}{2} = -4.5$$
$$f'(15) \approx \frac{-1.8 + -1.2}{2} = -1.5$$

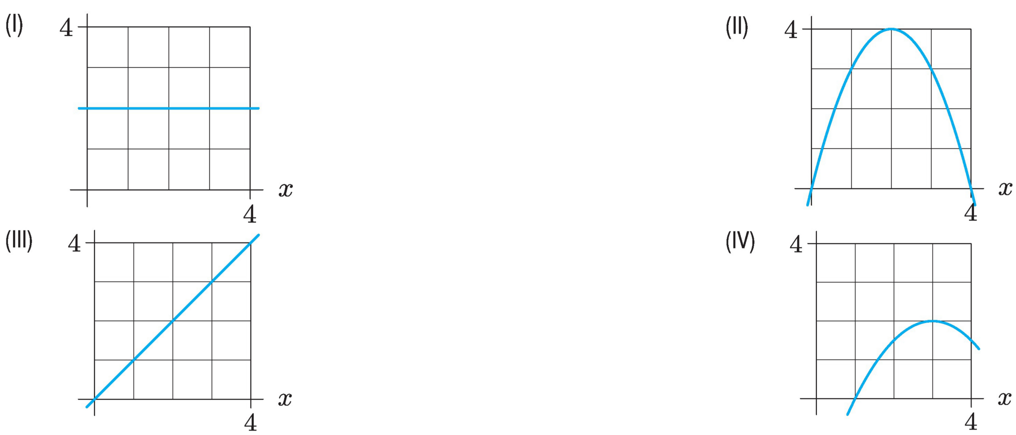
2. Match each property $(a) - (d)$ with one or more of graphs (I)–(IV) of functions.

   (a) $f'(x) = 1$ for all $0 \le x \le 4$. III

   (b) $f'(x) > 0$ for all $0 \le x \le 4$. III

   (c) $f'(2) = 1$ III & IV

   (d) $f'(1) = 2$ II & IV



Section 2.3

1. The cost, $C = f(w)$, in dollars of buying a chemical is a function of the weight bought, w, in pounds.

   (a) In the statement $f(12) = 5$, what are the units of the 12? What are the units of the 5? Explain what this is saying about the cost of buying the chemical.
   The 12 represents the weight of the chemical; therefore, its units are pounds. The 5 represents the cost of the chemical;therefore, its units are dollars. The statement $f(12) = 5$ means that when the weight of the chemical is 12 pounds, the cost is 5 dollars.

   (b) Do you expect the derivative f' to be positive or negative? Why?
   We expect the derivative to be positive since we expect the cost of the chemical to increase when the weight bought increases.

   (c) In the statement $f'(12) = 0.4$, what are the units of the 12? What are the units of the 0.4? Explain what this is saying about the cost of buying the chemical.
   Again, 12 is the weight of the chemical in pounds. The units of the 0.4 are dollars/pound since it is the rate of change of the cost as a function of the weight of the chemical bought. The statement $f'(12) = 0.4$ means that the cost is increasing at a rate of 0.4 dollars per pound when the weight is 12 pounds, or that an additional pound will cost about an extra 40 cents.

2. Suppose that $f(t)$ is a function with $f(25) = 3.6$ and $f'(25) = -0.2$.

   (a) Estimate $f(26)$. $f(26) \approx f(25) + f'(25)(26 - 25) = 3.4$

   (b) Find the relative rate of change at $t = 25$.
   $\frac{f'(25)}{f(25)} = \frac{-0.2}{3.6}$