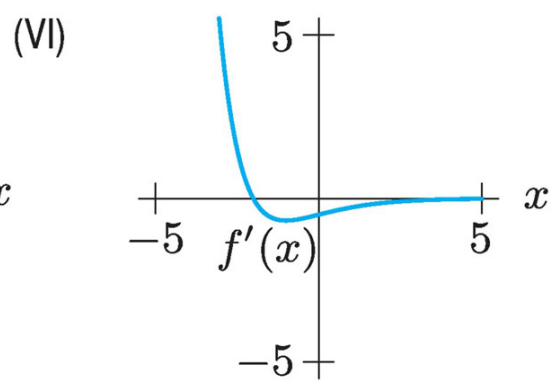
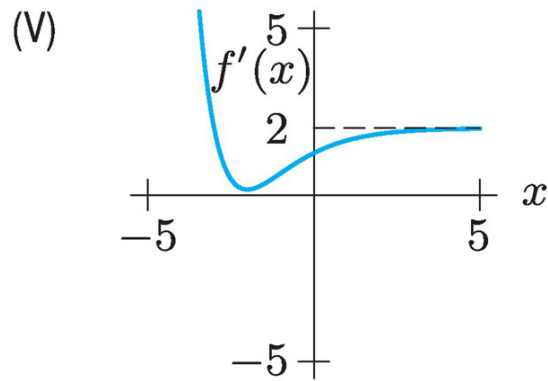
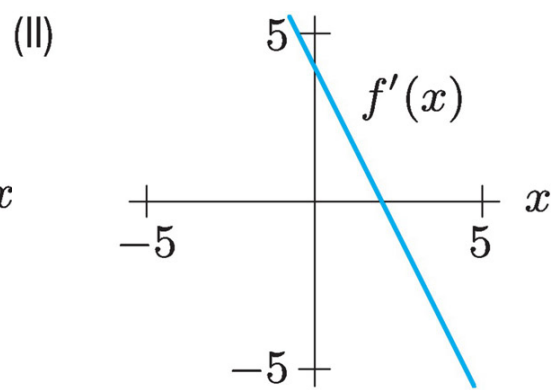
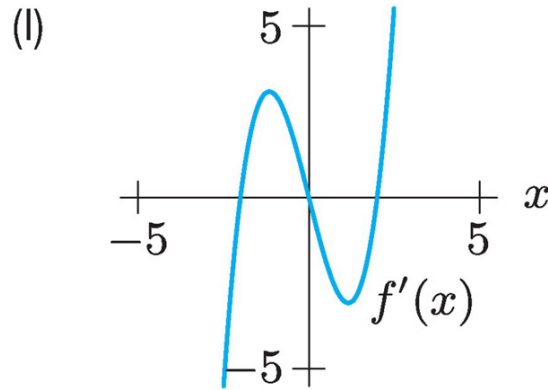


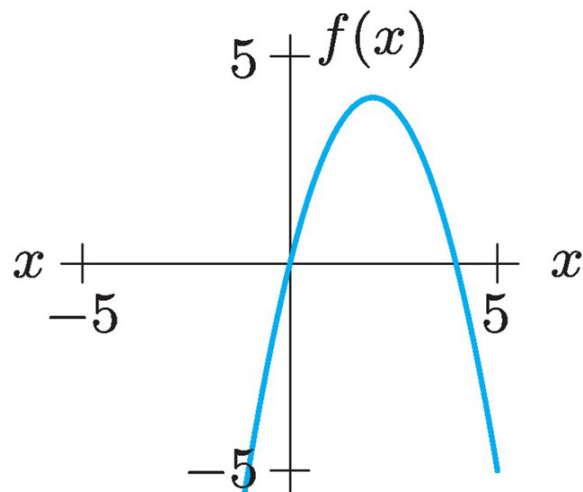
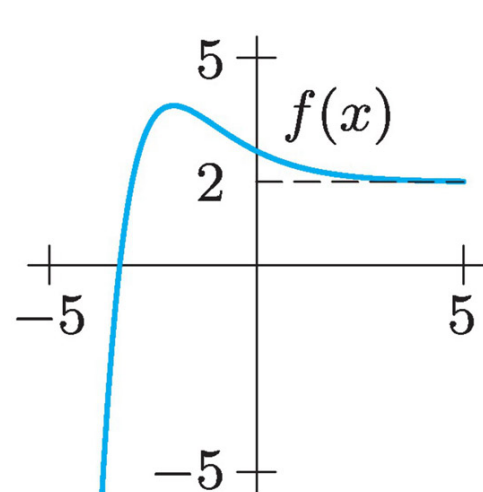
2.2: The Derivative Function

Definition: For a function f , we define the **derivative function**, f' , by

$$f'(x) = \text{Instantaneous rate of change of } f \text{ at } x = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}.$$



Exercise 1: Match each of the two graphs below to one of the derivative graphs above.

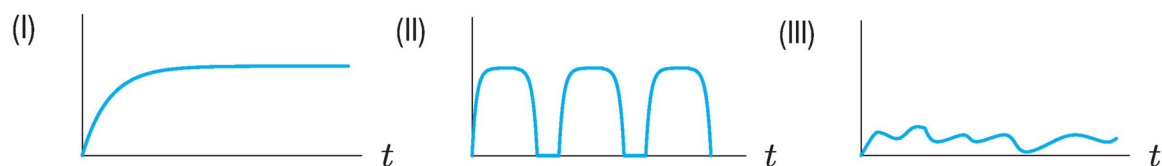


Exercise 2: Draw a possible graph of $y = f(x)$ given the following information about its derivative.

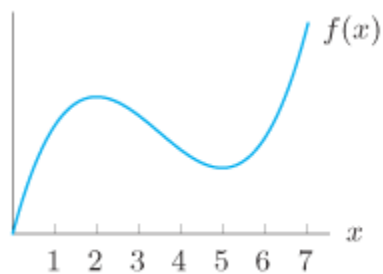
1. $f'(x) > 0$ for $x < -1$
2. $f'(x) < 0$ for $x > -1$
3. $f'(x) = 0$ for $x = -1$

Exercise 3: A vehicle moving along a straight road has distance $f(t)$ from its starting point at time t . Which of the graphs below could be $f'(t)$ for the following scenarios?

1. A bus on a popular route, with no traffic
2. A car with no traffic and all green lights
3. A car in heavy traffic conditions



Exercise 4: Sketch the derivative of the function $f(x)$ given below.



Exercise 5: Sketch the derivative of the function $f(x)$ given below.

