

CHAPTER 6

Applications of the Derivative

SECTION 6.1

- 6.1.1 Find the extreme values for $f(x) = \frac{x}{2} + 2$ on the interval $[0, 100]$ and determine where those occur.
- 6.1.2 Find the extreme values for $f(x) = 2x^3 - 3x^2 - 12x + 8$ on the interval $[-2, 2]$ and determine where those values occur.
- 6.1.3 Find the extreme values for $f(x) = \frac{x^3}{3} - x^2 - 3x + 1$ on the interval $[-1, 2]$ and determine where those values occur.
- 6.1.4 Find the extreme values for $f(x) = 2x^3 - 3x^2 - 12x + 5$ on the interval $[0, 4]$ and determine where those values occur.
- 6.1.5 Find the extreme values for $f(x) = x^3 - 6x^2 + 5$ on the interval $[-1, 5]$ and determine where those values occur.
- 6.1.6 Find the extreme values for $f(x) = x^3 + \frac{3}{2}x^2 - 18x + 4$ on the interval $[0, 4]$ and determine where those values occur.
- 6.1.7 Find the extreme values for $f(x) = x - \sin x$ on the interval $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ and determine where those values occur.
- 6.1.8 Find the extreme values for $f(x) = 1 - x^{2/3}$ on the interval $[-1, 1]$ and determine where those values occur.
- 6.1.9 Find the extreme values for $f(x) = 2 \sec x - \tan x$ on the interval $\left[-\frac{\pi}{4}, \frac{\pi}{4}\right]$ and determine where those values occur.
- 6.1.10 Find the extreme values for $f(x) = x^{4/3} - 3x^{1/3}$ on the interval $[-1, 8]$ and determine where those values occur.
- 6.1.11 Find the extreme values for $f(x) = \frac{\sqrt{x}}{x^2 + 3}$ on the interval $(0, +\infty)$ and determine where those values occur.
- 6.1.12 Find the extreme values for $f(x) = \frac{x}{x^2 + 1}$ on the interval $[0, 2]$ and determine where those values occur.
- 6.1.13 Find the extreme values for $f(x) = \frac{|x|}{1 + |x|}$ on the interval $[0, +\infty)$ and determine where those values occur.
- 6.1.14 Find the extreme values for $f(x) = \frac{1}{x - x^2}$ on the interval $(0, 1)$ and determine where those values occur.
- 6.1.15 Find the extreme values for $f(x) = \begin{cases} x^2 & x < 0 \\ x^3 & x \geq 0 \end{cases}$ $(-\infty, +\infty)$ and determine where those values occur.

- 6.1.16 Find the extreme values for $f(x) = \begin{cases} -x - 1 & x < -1 \\ 1 - x^2 & -1 \leq x \leq 1 \\ x - 1 & x > 1 \end{cases}$ on the interval $[-2, +2]$ and determine where those values occur.
- 6.1.17 Find the extreme values for $f(x) = \begin{cases} 1 - x^2 & x < 0 \\ x^3 - 1 & x \geq 0 \end{cases}$ on the interval $[-2, 1]$ and determine where those values occur.
- 6.1.18 Find the extreme values for $f(x) = |3 - 2x|$ on the interval $[-2, 2]$ and determine where those values occur.