

Examples:

The Derivative

5. Determine the equation of the line that is perpendicular to the tangent to the graph of $f(x) = \frac{1}{x+2}$ at the point where $x = 3$ and that intersects at the point of tangency.

The Product Rule

3. The position, s , in centimeters, of an object moving in a straight line is given by $s(t) = t(6 - 3t)^4$, $t \geq 0$, where t is the time in seconds. Determine the object's velocity at $t = 2$.

The Quotient Rule

2. An object moves along a straight line. The object's position, s , at t seconds is modeled by $s(t) = \frac{5t}{t^2+1}$, $t \geq 0$. When does the object change direction?

Derivatives of Composite Functions

6. An environmental study of a certain suburban community suggests that the average level of carbon monoxide in the air can be modeled by the function $C(p) = \sqrt{0.5p^2 + 17}$, where $C(p)$ is in parts per million, and population, p , is expressed in thousands. It is estimated that t years from now, the population of the community will be $p(t) = 3.1 + 0.1t^2$ in thousands. At what rate will the carbon monoxide level be changing with respect to time three years from now?