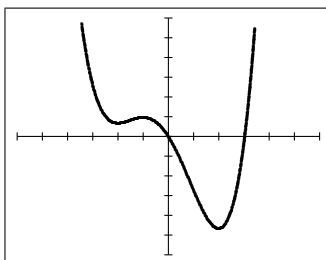
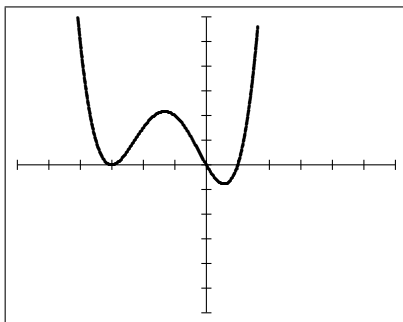


1. Evaluate $\lim_{t \rightarrow -2} \frac{t+2}{t^2-4}$.
2. Evaluate $\lim_{x \rightarrow 0} \frac{\frac{1}{x+1} - 1}{x}$.
3. Evaluate $\lim_{x \rightarrow \infty} \frac{2x^2}{3x^2+5}$.
4. Evaluate $\lim_{x \rightarrow -\infty} \frac{3^x - 3^{-x}}{3^x + 3^{-x}}$.
5. Simplify the difference quotient for $f(x) = 3x^2 + 7x$.
6. Use the limit process to find $f'(x)$ for $f(x) = x^2 - 2x + 3$.
7. Find $f'(x)$ for the following.
 - (a) $f(x) = 4x^4 - 5x^2$
 - (b) $f(x) = \frac{2}{3x^2}$
 - (c) $f(x) = 3 \cos(x) - \frac{\sin(x)}{4}$
 - (d) $f(x) = (3x^2 + 7)(x^2 - 2x + 3)$
 - (e) $f(x) = \frac{6x-5}{x^2+1}$
 - (f) $f(x) = 1 - \cos(2x) + 2 \cos^2(2x)$
 - (g) $f(x) = \left(x^2 + \frac{1}{x}\right)^5$
8. Find the equation of the tangent line to the function $f(x) = \frac{2}{x+1}$ at the point $(0, 2)$.
9. A graph of $f(x)$ is given. Sketch a graph of the derivative of $f'(x)$.



10. Below is the graph of $f'(x)$.



- (a) Identify the intervals on which $f(x)$ is increasing or decreasing.
- (b) Give the values of x at which $f(x)$ has a relative maximum or minimum.
- (c) Sketch a possible graph of $f(x)$.
11. Find $\frac{dy}{dx}$ for $x^3 + y^3 - 6x^2y = 0$.
12. A point is moving along the graph of $y = x^2 + 1$. Find the rate of change of the distance from the point to the origin if $\frac{dx}{dt} = 2$ cm/s.
13. Find the extreme values of $f(x) = \frac{x}{\sqrt{x^2 + 1}}$ on the interval $[0, 2]$.
14. Determine the intervals of increase/decrease, relative extrema, inflection points, and intervals of concave up/down for $f(x) = (x + 2)^2(x - 4)$.
15. A rectangle is bounded by the x - and y -axes and the graph of $y = \frac{6 - x}{2}$. What length and width should the rectangle have so that its area is a maximum?