

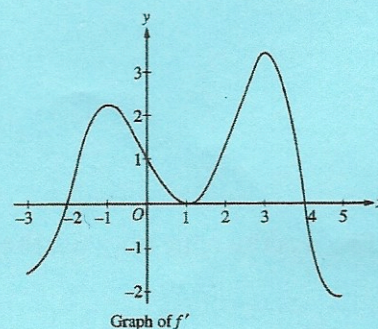
Directions: Be sure to show all your work. Graphing calculators are allowed and encouraged. If necessary, round answers to 3 decimal places when appropriate.

1. Use a linear approximation to estimate $\sqrt{8}$. Is this an overestimate or an under estimate? Be sure to identify the linear function used to estimate the value.

2. Given $f(x) = \sin x + \cos x$ on the interval $[0, 2\pi]$, find the absolute maximum and absolute minimum values and their location(s).

3. Function f has a domain of $[-3, 5]$. The graph of the derivative of function f is given to the right. The graph has horizontal tangents at $x = -1$, $x = 1$, and $x = 3$.

A. At what values of x does f have a relative maximum? Justify your reasoning.



B. On what open interval(s) is the graph of f concave down? Justify your reasoning.