DATE:

## Instantaneous Speed, Rate of Change, \& Slopes of Tangent Lines

1. A rock breaks loose from the top of a tall cliff. The position function for the rock is $f(t)=16 t^{2}$ feet. Find the speed of this falling rock at 3 seconds.
2. Evaluate the rate of change of the area of a circle when $r=7$ feet.
3. At what point is the tangent to $f(x)=3-4 x-x^{2}$ horizontal? (HINT: What is the slope of a horizontal line?)
4. A line is tangent to a graph $y=f(x)$ at the point $(1,4)$ and the tangent line passes through $(3,6)$. What is $f^{\prime}(1)$ ?
