Group Work 1, Section 3.8
Four Variations on a Theme

Consider the following four functions:

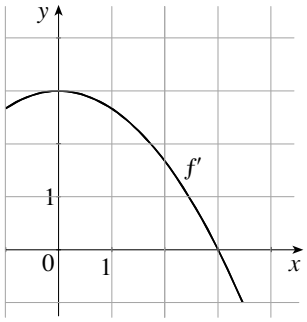
$$f(x) = e^{x-1} - 1 \qquad g(x) = x^4 - 3x + 2 \qquad h(x) = \ln x \qquad j(x) = \frac{2}{\pi}\sin\left(\frac{\pi}{2}(x-1)\right)$$

1. Find the linearizations of f, g, h, and j at $a = 1$.

2. Compute the values of each of these functions at $x = 1.1$ and the values of their linearizations. For which function is the approximation best? For which is it worst? Why?

Group Work 2, Section 3.8
Linear Approximation

Consider this graph of $f'(x)$, the *derivative* of $f(x)$.



1. Suppose that $f(2) = 4$. Approximate $f(1.98)$ and $f(2.02)$ as best you can. Don't just guess. Show your work.

2. Determine whether your approximations were overestimates or underestimates.

3. Suppose you also know that $f(3) = 7$. Can you approximate $f(2.98)$ and $f(3.02)$? Explain your answer.