

The goal here is to approximate \sqrt{x} for values near $x = 4$.

Let $f(x) = \sqrt{x}$.

1. Show that the point $(4.41, 2.1)$ lies on the graph $y = f(x)$.
2. Use the points $(4, 2)$ and $(4.41, 2.1)$ to approximate $f'(4)$.
3. Find an equation for the line tangent to the graph of $f(x)$ at $x = 4$.
4. Plot $f(x)$ and the tangent line on the same set of axes. Do they look close to each other near $x = 4$?
5. Use your equation of the tangent line to approximate $\sqrt{4.01}$. How close is your answer to the “real” value?
6. Approximate $\sqrt{3.98}$. How close is your answer to the “real” value?