Assignment 10

1. Use linear approximation and quadratic approximation to approximate $(63)^{1/3}$.
2. Find the linear approximation to $y = \sin x$ centered at $x = 0$.
3. Find $\sqrt{9.02}$ approximately using linear approximation.
4. For a function $f(x)$ we know that $f(3) = 2$ and that $f'(3) = -3$. Give an estimate for $f(2.91)$.
5. The function $f(x)$ has the following properties: $f(5) = 2,\ f'(5) = 0.6,\ f''(5) = -0.4$.
   - (a) Find the tangent line to $y = f(x)$ at the point $(5, 2)$.
   - (b) Use (a) to estimate $f(5.2)$.
   - (c) If f is known to be concave down, could your estimate in (b) be greater that the actual value $f(5.2)$? Justify your answer.
6. What is the maximum error in approximating $\ln(1 - x)$ centred at 0 by the quadratic polynomial $p_2(x)$ in the interval $[-1/2, 1/2]$.