1. (5 pts) Find the line tangent to \( y = 6x^2 - 40x + 25 \) at the point \((0, 25)\).

   a. Find derivative of \( f(x) = 6x^2 - 40x + 25 \).

   \[ f'(x) = (6x^2 - 40x + 25)' \]
   \[ = (6x^2)' - (40x)' + (25)' \]
   \[ = 12x - 40 \]

   b. Find slope: \( f'(0) \)

   \[ f'(0) = 12(0) - 40 \]
   \[ f'(0) = -40 \]

   \[ f'(0) = \frac{12(0) - 40}{m} \]

   c. Use point-slope form with \( m = -40 \) and point \((0, 25)\).

   \[ y - 25 = f'(0)(x - 0) \]
   \[ y - 25 = -40(x - 0) \]

   \[ y = -40x + 25 \]

2. (5 pts) Find the linearization of \( f(x) = 2\sqrt{x} \) near \( x = 9 \) and use it to approximate the value of \( 2\sqrt{9.1} \).

   Either use \( f(x+h) \approx f(x) + f'(x)h \) OR \( f(x) \approx f(a)(x-a) + f(a) \)

   From formula we have \( f'(x) = \frac{1}{\sqrt{x}} \).

   \[ f'(x) = \frac{1}{\sqrt{9}} \]

   \[ f'(9) = \frac{1}{3} \]

   From formula we have \( 2\sqrt{x} \approx (2\sqrt{a})'(x-a) + 2\sqrt{a} \)

   \[ f(9) \approx (\frac{1}{\sqrt{9}})(x-9) + 2\sqrt{9} \]

   \[ 2\sqrt{9} \approx \frac{1}{3} (x-9) + 6 \]

   For approximating \( 2\sqrt{9.1} \), we want to set \( 9.1 = 9 + h \)

   Then plug \( h = 0.1 \) into squared formula

   \[ 2\sqrt{9} \approx 6 + \frac{h}{3} \]

   \[ 2\sqrt{9} \approx 6 + \frac{0.1}{3} \]

   \[ 2\sqrt{9} \approx 6 + \frac{0.3}{3} \]

   \[ 2\sqrt{9} \approx 6 + \frac{1}{30} \]

   \[ 2\sqrt{9} \approx \frac{181}{30} \]