

4.2 Exercise Problems Linear Approximation

p. 278-281 #35-38 all

Use the given information and a linear approximation to approximate the value of the function at c .

$$35) f(2) = 8 \quad f'(2) = -3 \quad c = 2.06$$

$$\begin{array}{l} y - 8 = -3(x - 2) \\ y = -3(x - 2) + 8 \end{array} \quad \left| \begin{array}{l} y(2.06) = -3(2.06 - 2) + 8 \\ \boxed{y(2.06) = 7.82} \end{array} \right.$$

$$36) f(-4) = 3 \quad f'(-4) = 2 \quad c = -3.6$$

$$\begin{array}{l} y - 3 = 2(x + 4) \\ y = 2(x + 4) + 3 \end{array} \quad \left| \begin{array}{l} y(-3.6) = 2(-3.6 + 4) + 3 \\ \boxed{y(-3.6) = 3.8} \end{array} \right.$$

$$37) f(-1) = 0 \quad f'(-1) = \frac{3}{2} \quad c = -1.1$$

$$\begin{array}{l} y - 0 = \frac{3}{2}(x + 1) \\ y = \frac{3}{2}(x + 1) \end{array} \quad \left| \begin{array}{l} y(-1.1) = \frac{3}{2}(-1.1 + 1) \\ \boxed{y(-1.1) = -0.15} \end{array} \right.$$

$$38) f(5) = \frac{1}{2} \quad f'(5) = -3 \quad c = 5.2$$

$$\begin{array}{l} y - \frac{1}{2} = -3(x - 5) \\ y = -3(x - 5) + \frac{1}{2} \end{array} \quad \left| \begin{array}{l} y(5.2) = -3(5.2 - 5) + \frac{1}{2} \\ \boxed{y(5.2) = -0.1} \end{array} \right.$$