Quiz 9
Math 180 Section 102

Workshop Section? Circle one:
Tuesday       Wednesday       Thursday       Friday in Math 104       Friday in Math 204

Answer the following questions. Work individually. No electronic devices or notes are permitted.

1. The figure below shows \( f(x) \) and its linearization at \( x = a, \ y = 4x - 3 \).

   \[
   y = 4x - 3
   \]

   \[
   f(x)
   \]

   (a) What is the value of \( a \)?

   \[\boxed{5}\]

   (b) What is the value of \( f(a) \)?

   \[4 \cdot 5 - 3 = 17\]

   (c) Use the linearization to approximate the value of \( f(5.4) \).

   \[
   f(5.4) \approx 4(5.4) - 3.
   \]

   \[
   = 20 + 1.6 - 3
   \]

   (d) Is the approximation an under- or overestimate?

   \[\text{under} \]

2. Write the Taylor polynomial of degree 5 for the function \( f(x) = \sin(x) \) centered at \( x = 0 \).

   \[
   T_5(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!}
   \]