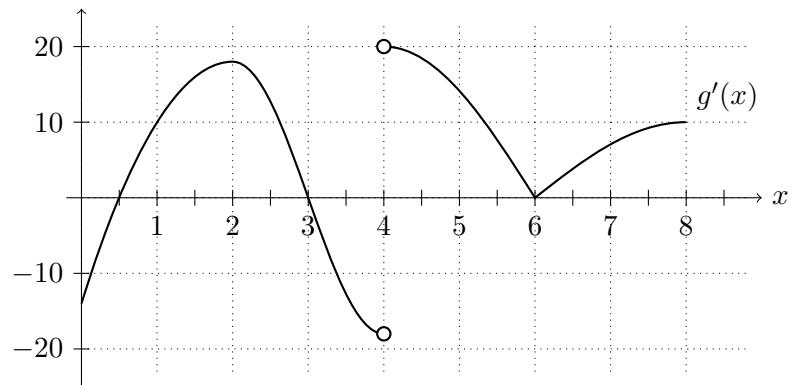4. [17 points] The function $g(x)$ is continuous on the interval $0 < x < 8$. The graph of $g'(x)$, the **derivative** of $g(x)$, is shown below.

a. [6 points]   List the x-coordinates of the critical points of the function $g(x)$ and state whether each is a local maximum, local minimum, or neither. You do not need to justify your answers.

b. [3 points] List the x-coordinates of the inflection points of the function $g(x)$. You do not need to justify your answers.

c. [3 points] Suppose that $g(1) = 8$. Write an equation for the best linear approximation to $g(x)$ at $x = 1$.

$$g(x) \approx \underline{\hspace{5in}}$$

d. [2 points] Use your approximation from part **(c)** to estimate $g(1.05)$.

e. [3 points] Is your estimate for $g(1.05)$ an overestimate or an underestimate? Explain.