2.1 Supplementary Material

1. Let $b(t) = 3 \cdot (1.68)^t$ be a model for a bacteria population (measured in millions) at time t (in hours). Find (a) the initial bacteria population, and (b) the average rate of change of b from $t = 1$ to $t = 3$.

   <u>Bonus</u>: How many bacteria grow each second, on average?

2. Find the secant line for $b(t) = 2.2^t$ on the interval $[-1, 2]$.

3. (a) Find the instantaneous rate of change of $g(t) = \log_{10}(t)$ at $t = 2$, and then (b) find the equation of the tangent line at $t = 2$.

4. Use the derivative to find the equation of the tangent line of the function $h(r) = 2.3 + 6r^3$ at the point where $r = 4$.

5. For the function $s(t) = 3\sin(t)$, use the estimation technique to approximate $\left.\dfrac{ds}{dt}\right|_{\pi/2}$.