Show all work: unjustified answers may receive less than full credit.

1. Find the antiderivative of the following functions:
   a. \( f(x) = 5x^{\frac{1}{3}} - 6\cos(x) \)
   \( F(x) = 5\frac{x^{\frac{4}{3}}}{\frac{4}{3}} - 6\sin(x) + C \)
   \( F(x) = x^{\frac{4}{3}} - 6\sin(x) + C \)
   \( F(0) = 3 \)
   \( F(x) = x^{\frac{4}{3}} + C \)
   \( F(x) = x^{\frac{4}{3}} + C \)
   \( 3 = F(0) = 0^{\frac{4}{3}} + 1 + C \implies C = 2 \)

2. A football player records the following running speeds in a race (velocity is in feet per second, time is in seconds). Use \( L_3 \) and \( R_3 \) to estimate the distance traveled.

   \[
   \begin{array}{c|cccc}
   t & 0 & 1 & 2 & 3 \\
   \hline
   v & 0 & 20 & 30 & 31 \\
   \end{array}
   \]

   \( L_3 = \frac{1}{3} (0 + 20 + 30) = 50 \text{ ft} \)
   \( R_3 = \frac{1}{3} (20 + 30 + 31) = 81 \text{ ft} \)

3. Find the formula for \( R_n \) for the function \( f(x) = e^x \) on the interval \([0, 1]\), making sure you show the \( i^{th} \) term of the sum.

   \[
   R_n = \frac{1}{n} \left[ e^{\frac{0}{n}} + e^{\frac{2}{n}} + e^{\frac{3}{n}} + \ldots + e^{\frac{n}{n}} \right]
   \]