Name ______________________________

- You have 15 minutes
- No calculators
- Show sufficient work

1. (3 points) Evaluate the following indefinite integral.

\[ \int (1 + \sqrt{x})^2 \, dx \]

2. (3 points) Evaluate and simplify the following definite integral.

\[ \int_{4}^{32} \frac{1}{3x} \, dx \]
3. (2 points) Fill in the missing information to show that the given definite integral can be expressed as the limit of a Riemann sum. The only variables appearing in your limit should be $n$ and $k$. You do not need to evaluate this limit.

$$\int_{2}^{5} \sin(x^2) \, dx = \lim_{n \to \infty} \sum_{k=1}^{n} \left[ \right]$$

4. (2 points) Evaluate the following limit. Be sure to use proper notation throughout your evaluation of this limit.

$$\lim_{n \to \infty} \sum_{k=1}^{n} \left( \frac{50}{n^3} + \frac{10k}{n^2} + \frac{3}{n} \right)$$