1. (2 points) The area between the $x$-axis and the graph of $f(x) = \ln x$ on the interval $[3, 7]$ can be written as a limit. Fill in the missing information in this limit.

\[
\text{AREA} = \lim_{n \to \infty} \sum_{k=1}^{n} \left[ight]
\]

2. (2 points) Evaluate the following limit.

\[
\lim_{n \to \infty} \sum_{k=1}^{n} \left(\frac{10k}{n^2} + \frac{3}{n}\right)
\]
3. (2 points) Evaluate and simplify the following definite integral.

\[ \int_{1}^{2} (6x - 5) \, dx \]

4. (2 points) Evaluate the following indefinite integral.

\[ \int (-4 + \tan^2 x) \, dx \]

5. (2 points) Suppose that \( f \) is integrable on the interval \([2, 9]\). Given that \( \int_{2}^{5} f(x) \, dx = 4 \) and \( \int_{2}^{9} f(x) \, dx = 25 \), evaluate the following definite integrals.

(a) \( \int_{5}^{9} f(x) \, dx \)

(b) \( \int_{5}^{2} f(x) \, dx \)