8. [6 points] Suppose that $\int_{-3}^{8} f(x)dx = 5$. Use this information to determine the values for the constants $a$, $b$, and $k$ that you are certain will satisfy the definite integral $\int_{a}^{b} kf(2x)dx = 5$. Write your answers on the spaces provided. You do not need to show your work for this problem.

\[ a = \boxed{-1.5} \quad b = \boxed{4} \quad k = \boxed{2} \]

9. [6 points] Suppose $f(x) = f'(x) + 3$. Determine the EXACT value of $\int_{0}^{1} e^x f'(x)dx$ given that $f(0) = 1$ and $f(1) = 4$. Be sure to show enough work to support your answer.

**Solution:** We use integration by parts, letting $u = e^x$ and $dv = f'(x)dx$ so that $du = e^x dx$ and $v = f(x)$. Then we have

\[
\int_{0}^{1} e^x f'(x)dx = e^x f(x)|_{0}^{1} - \int_{0}^{1} e^x f(x)dx
\]
\[
= ef(1) - f(0) - \int_{0}^{1} e^x(f'(x) + 3)dx
\]
\[
= 4e - 1 - \int_{0}^{1} e^x f'(x)dx - 3 \int_{0}^{1} e^x dx
\]
\[
2 \int_{0}^{1} e^x f'(x) = 4e - 1 - 3e^x|_{0}^{1}
\]
\[
\int_{0}^{1} e^x f'(x) = \frac{1}{2}(4e - 1) - (3e - 3) = \frac{e + 2}{2}
\]