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.

$a =$ **-1.5** $b =$ **4** $k =$ **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

$$\begin{aligned}
\int_0^1 e^x f'(x)dx &= e^x f(x)|_0^1 - \int_0^1 e^x f(x)dx \\
&= ef(1) - f(0) - \int_0^1 e^x (f'(x) + 3)dx \\
&= 4e - 1 - \int_0^1 e^x f'(x)dx - 3\int_0^1 e^x dx \\
2\int_0^1 e^x f'(x) &= 4e - 1 - 3e^x|_0^1 \\
\int_0^1 e^x f'(x) &= \frac{1}{2}((4e-1) - (3e-3)) = \frac{e+2}{2}
\end{aligned}$$