STA 213

Problem 2.17

$$
\begin{aligned}
E\{T\} &= \int_0^\infty \Pr(T > t)dt \\
&= \int_0^\infty \left[ae^{-\lambda t} + (1-a)e^{-\mu t}\right] dt \\
&= -\frac{ae^{-\lambda t}}{\lambda} - \frac{(1-a)e^{-\mu t}}{\mu}\bigg|_0^\infty \\
&= \frac{a}{\lambda} + \frac{1-a}{\mu}
\end{aligned}
$$