Sanity check with respect to expected value. Sometimes it is case that there are upper
and lower bounds, say $M$ and $m$, so that $m \leq X \leq M$ all the time. Then we compute the
expected value of $X$, it is enough to just integrate from $m$ to $M$. So

$$E(X) = \int_{m}^{M} x f_X(x) \, dx \leq \int_{m}^{M} M f_X(x) \, dx = M \int_{m}^{M} f_X(x) \, dx = M(1) = M.$$ 

So $E(X) \leq M$ in such a case.

Similarly, with the lower bound

$$E(X) = \int_{m}^{M} x f_X(x) \, dx \geq \int_{m}^{M} m f_X(x) \, dx = m \int_{m}^{M} f_X(x) \, dx = m(1) = m.$$ 

So $E(X) \geq m$ in such a case.

So, in summary, if we have continuous random variable $X$ with $m \leq X \leq M$, then
$m \leq E(X) \leq M$ too.