Problem 9.3

Exercise 1

Let X be a continuous random variable with mean μ(x)and variance σ^2(x) and let $x^* = (x - \mu)/\sigma$ be its standardized version. Verify directly that $\mu(x^*) = 0$ and $\sigma^2(x^*) = 1$.

Solution: $E(x^*) = \frac{1}{\sigma}(E(x) - \mu)$

$= \frac{1}{\sigma}(\mu - \mu) = 0$

$\sigma^2(x^*) = E(\frac{x - \mu}{\sigma})^2$

$= \frac{1}{\sigma^2}\sigma^2 = 1$