STA2001 Tutorial 10

1. 4.5-8. Let X and Y have a bivariate normal distribution with parameters $\mu_X = 10$, $\sigma_X^2 = 9$, $\mu_Y = 15$, $\sigma_Y^2 = 16$ and $\rho = 0$. Find

   (a) $P(13.6 < Y < 17.2)$

   (b) $E(Y|x)$

   (c) $\text{Var}(Y|x)$

   (d) $P(13.6 < Y < 17.2|X = 9.1)$

2. 5.1-10. Let X has the uniform distribution $U(-1, 3)$. Find the pdf of $Y = X^2$.

3. 5.1-14. Let X be $N(0,1)$. Find the pdf of $Y = |X|$, a distribution that is often called the half-normal.

   Hint: Here $y \in S_y = \{y : 0 < y < \infty\}$. Consider the two transformations $x_1 = -y$, $-\infty < x_1 < 0$, and $x_2 = y$, $0 < x_2 < \infty$.