

a) Niech $X \sim U[-2, 2]$

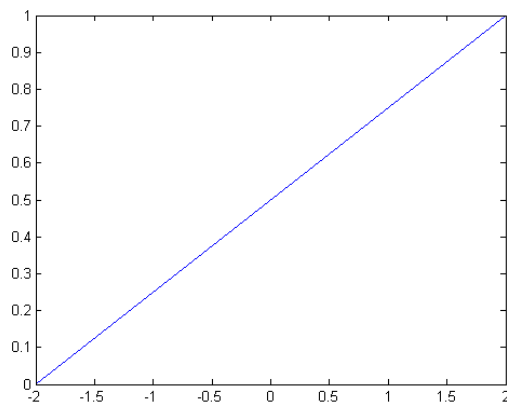


Figure 1: X

$$Y = \|X\|$$

$$F(y) = P(Y \leq y) = P(\|X\| \leq y) = P(-y \leq X \leq y) = P(X \leq y) - P(X \leq -y)$$

$$F_Y = F_X(y) - F_X(-y)$$

$$Y \sim U[0, 2]$$

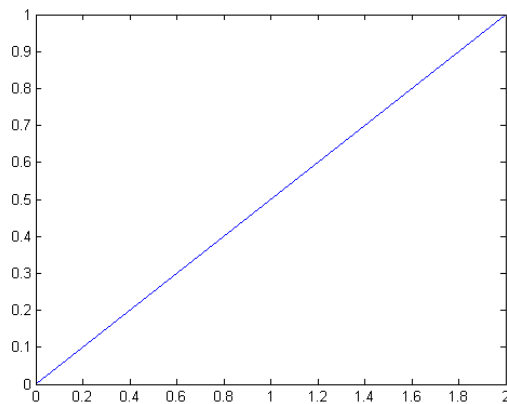


Figure 2: Y

b) Niech $X \sim U[-1, 1]$

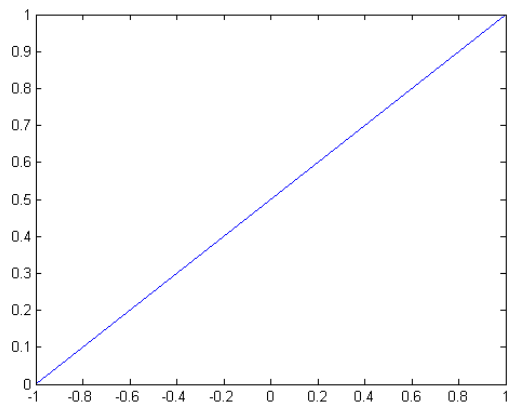


Figure 3: X

• $Y = X^3$

$$F(y) = P(Y \leq y) = P(X^3 \leq y) = P(X \leq \sqrt[3]{y})$$

$$F_Y = F_X(\sqrt[3]{y})$$

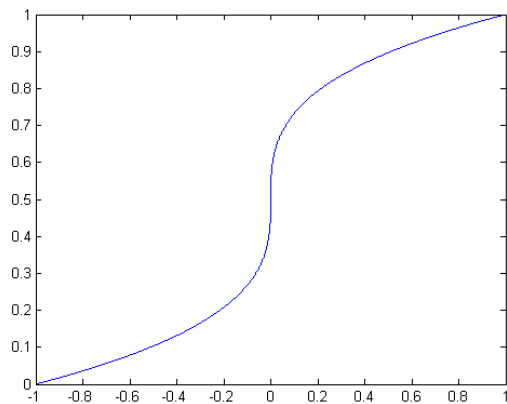


Figure 4: Y

- $Z = X^2$

$$F(y) = P(Z \leq y) = P(X^2 \leq y) = P(-\sqrt{y} \leq X \leq \sqrt{y})$$

$$P(X \leq \sqrt{y}) - P(X \leq -\sqrt{y})$$

$$F_Z = P(x \leq \sqrt{y}) - P(X \leq -\sqrt{y})$$

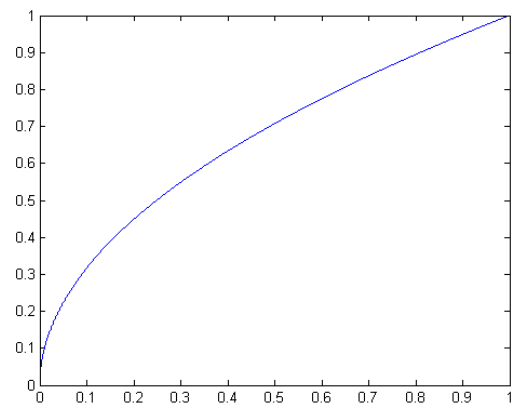


Figure 5: Z