1. Let X_1 and X_2 be two independent random variables. X_1 is normal $N(1,4)$ and X_2 is normal $N(1,2)$. Compute c such that

$$P\{X_1 - X_2 \leq c\} = .05$$

using one of the enclosed tables.

$$X_1 - X_2 \sim N(0, (\sqrt{6})^2)$$

$$.05 = \mathbb{P}(X_1 - X_2 \leq c)$$

$$= \mathbb{P}\left(\frac{X_1 - X_2}{\sqrt{6}} \leq \frac{c}{\sqrt{6}}\right)$$

$$\Rightarrow \frac{c}{\sqrt{6}} = z_{.05} \in (-1.65, -1.64)$$

$$\Rightarrow c \in (-1.65\sqrt{6}, -1.64\sqrt{6})$$