Exercise sheet

Let \( Z = \text{Normal (0, 1)} \) random variable with pdf f. on \((0, \infty)\).

1. If \( P(0 \leq Z \leq 2) = 0.4772 \), find \( P(-2 \leq Z \leq 2) \)

2. Find \( P(0 \leq Z < \infty) \)

3. Given \( P(0 \leq Z \leq 1.26) = 0.3962 \)

   \( P(-1.43 \leq Z \leq 1.43) = 0.8492 \),

   find \( P(1.26 \leq Z \leq 1.43) \)

4. Find \( P(Z > 1.26) \)

5. Find \( P(Z < -1.26) \)

6. You peek into your friend's sheet and find
   he/she has an answer = 1.327 which is not what you have for the above questions. Should you panic?
7. X is a RV with Normal distribution \((\mu, \sigma)\)

Reason carefully which of the following data cannot be from X

Set A
- \(E(X) = 2\)
- \(SD(X) = 1\)
- \(Var(X) = 2\)
- \(P(2 \leq X < 60) = 0.5\)

Set B
- \(E(X) = -1\)
- \(SD(X) = 1\)
- \(Var(X) = 1\)
- \(P(-\infty < X \leq -1) = 0.3\)

Set C
- \(E(X) = 7\)
- \(SD(X) = 1\)
- \(Var(X) = 1\)
- \(P(7 < X \leq \infty) = 0.5\)

**?** Given X is a uniform distribution with pdf \(f(x) = \frac{1}{b-a}\) defined on \([a, b]\), find a

- What is the median for \(Z = N(0, 1)\) on \((-\infty, \infty)\)?
- What is the mean of \(Z\)?
- What is the median for \(X = N(\mu, \sigma)\) on \((-\infty, \infty)\)?
- What is the mean for \(X\)?

**?** A gambler tosses a biased coin \(\text{PC (landing heads) = } \frac{1}{4}\) 200 times. \(X\) is the RV which counts the # of heads gotten in total.

- Find Std deviation \(\text{Var}(X)\)
- Approximately using normal curves, find prob that he gets at least 50 heads.