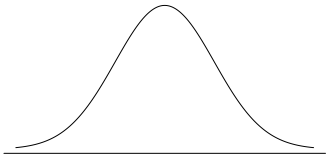
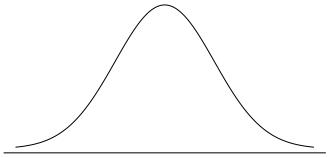
Activity 3: Normal Distribution
STAT 310, Spring 2023

Exercise 1. Suppose $Z \sim N(\mu = 0, \sigma = 1)$ is a random variable following a standard normal distribution. Use the R function `pnorm()` to compute the following probabilities:

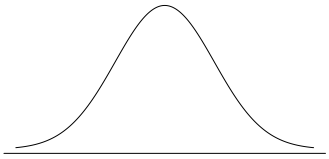
(a) $P(Z < 1.4)$



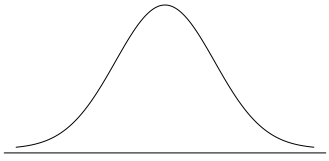
(b) $P(Z > 2.2)$



(c) $P(-0.5 < Z < 1.5)$

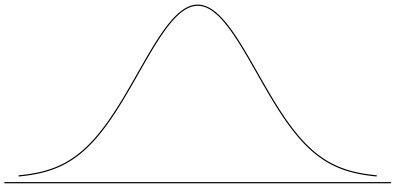


Exercise 2. Use the R function `qnorm()` to find 90th percentile of the standard normal distribution $N(\mu = 0, \sigma = 1)$.

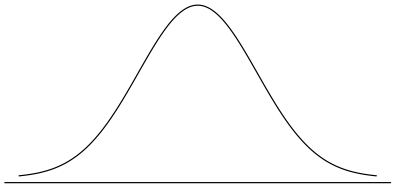


Exercise 3. SAT scores are normally distributed with mean $\mu = 1100$ and standard deviation $\sigma = 200$. That is, $X \sim N(\mu = 1100, \sigma = 200)$

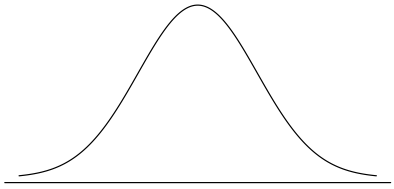
(a) About what percent of test takers score below a 750?



(b) About what percent of test takers score above a 1500?



(c) About what percent of test takers score between 800 and 1400?



(d) What is the cutoff for the highest 25% of SAT scores (i.e., find the 75th percentile)?