# MTH 115 Practice Problems 2

1.  Problem 24 on page 198 of the textbook.

2.  A new variety of turf grass has been developed for use on golf courses, with the goal of obtaining a germination rate of 85%. To evaluate the grass, 20 seeds are planted in a greenhouse so that each seed will be exposed to identical conditions. If the 85% germination rate is correct, what is the probability that 18 or more of the 20 seeds will germinate?

3.  Refer to the turf grass problem above.
a.  Out of the 20 seeds, how many would you expect to germinate? Please explain.
b.  What is the standard deviation of the number of seeds that will germinate?
c.  Did you use the binomial distribution to answer parts **a.** and **b.**? Please explain.

4.  The density curve of a continuous variable $x$ is given below.
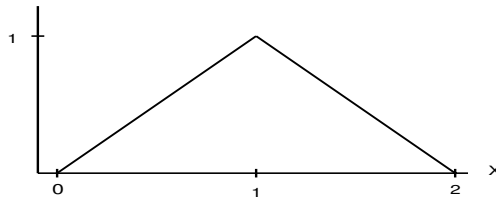


a.  What proportion of $x$-values are less than $\sqrt{2}/2$?
b.  What proportion of $x$-values are between $\sqrt{2}/2$ and 1?
c.  Find the lower quartile, median, and upper quartile of the continuous variable $x$.

5.  Problems 1-5 on page 291 of the textbook.

6.  Find the 35th percentile of the standard normal distribution.

7.  A machine that cuts corks for wine bottles operates so that the diameter of the cork produced is approximately normally distributed with mean 3.0 cm and standard deviation 0.1 cm.

a.  Find the probability that the diameter of a randomly selected cork is no more than 2.8 cm.
b.  What is the probability that the diameter of a randomly selected cork is equal to 3.0 cm?
c.   The specification call for corks whose diameters are between 2.9 cm and 3.1 cm. A cork not meeting the specifications is considered defective (a cork that is too small leaks while a cork that is too large doesn't fit the bottle). What proportion of the corks produced by the machine are defective?

**8.** The lifting capacities of industrial workers are assumed to be normally distributed with mean = 65 lbs and standard deviation = 10 lbs.

**a.** What is the probability a randomly selected worker can lift more than 80 lbs?

**b.** Suppose random samples of 16 workers are chosen. What is the distribution of the mean lifting capacity of these samples? Did you use the CLT to answer this question? Explain.

**c.** What is the probability that a sample of workers in part b. has a mean lifting capacity that is between 65 and 70 lbs?

**9.** Suppose that a particular candidate for a public office is in fact favored by 48% of all registered voters in the district. A polling organization will take a random sample of 500 voters and will use $\widehat{p}$, the sample proportion, to estimate $p$. What is the approximate probability that $\widehat{p}$ will be greater than 0.5, causing the polling organization to incorrectly predict the result of the upcoming election?