

Homework 1.2

For all questions, assume that the distribution is normal. For each problem, draw the normal curve.

1. A survey found that mean length of time that Americans keep their cars is 5.3 years with a standard deviation of 1.2 years. If a person decides to purchase a new car, find the probability that he or she has owned the old car for

- a) less than 2.5 years $\text{Normalcdf}(0, 2.5, 5.3, 1.2) = .98\%$
 b) between 3 and 6 years 69.25%
 c) more than 7 years 7.83%
 d) The length of time John keeps his car is in the 90th percentile. Determine how long John keeps his car.

$$\text{InvNorm}(.9, 5.3, 1.2) = \boxed{6.8 \text{ years}}$$

2. The average waiting time at Walgreen's drive-through window is 7.6 minutes, with a standard deviation of 2.6 minutes. When a customer arrives at Walgreen's, find the probability that he will have to wait

- a) between 4 and 6 minutes 18.61%
 b) less than 3 minutes 3.67%
 c) more than 8 minutes 43.89%
 d) Only 8% of customers have to wait longer than Mrs. Sickalot. Determine how long Mrs. Sickalot has to wait.

$$\text{InvNorm}(.92, 7.6, 2.6) = \boxed{11.25 \text{ min}}$$

3. The scores on an Algebra II test have a mean of 76.4 and a standard deviation of 11.4. Find the probability that a student will score

- a) above 78 42.50%
 b) below 60 7.51%
 c) between 80 and 85 15.08%
 d) Mr. Reeves scales his tests so that only 5% of students can receive an A. What is the minimum score Andrea can make on this test and still get an A?

$$\text{InvNorm}(.95, 76.4, 11.4) = \boxed{95.15} \text{ or } \boxed{96}$$

4. The average life of automobile tires is 30,000 miles with a standard deviation of 2000 miles. If a tire is selected and tested, find the probability that it will have a lifetime

- a) between 25,000 and 28,000 miles 15.24%
 b) between 27,000 and 32,000 miles 77.45%
 c) over 35,000 miles $.62\%$
 d) The tire company will replace tires whose tread life falls in the lowest 15% of all tires of this model. What is the lifetime of a tire that qualifies for replacement?

$$\text{InvNorm}(.15, 30000, 2000) = \boxed{27,927 \text{ miles}}$$

5. The mean height of an American man is 69" with a standard deviation of 2.4". If a man is selected at random, find the probability that he will be

- a) between 68" and 71" tall 45.92%
 b) shorter than 67" 20.23%
 c) taller than 72" 10.56%
 d) If Jose is in the 75th percentile, how tall is he?

$$\text{InvNorm}(.75, 69, 2.4) = \boxed{70.62 \text{ in}}$$