

# CONTINUOUS RANDOM VARIABLES: PRACTICE 1; UNIFORM DISTRIBUTION

## STUDENT LEARNING OUTCOMES:

- THE STUDENT WILL EXPLORE THE PROPERTIES OF DATA WITH A UNIFORM DISTRIBUTION

## GIVEN:

The age of cars in the staff parking lot of a suburban college is uniformly distributed from six months (0.5 years) to 9.5 years.

## PROPERTIES OF THE DATA

1. What is being measured here?
2. In words, define the Random Variable X.

X = \_\_\_\_\_

3. Are the data continuous or discrete?
4. The interval of values for X is: \_\_\_\_\_
5.  $X \sim$  \_\_\_\_\_

## PROBABILITY DISTRIBUTION

6. Write the probability density function:  $f(x) =$  \_\_\_\_\_
7. Sketch the graph of the probability distribution. Include:
  - a. lowest value for X = \_\_\_\_\_ highest value for X = \_\_\_\_\_
  - b. labeling on x-axis (words): \_\_\_\_\_
  - c. height of rectangle = \_\_\_\_\_ labeling on y-axis: \_\_\_\_\_



### RANDOM PROBABILITY

Find the probability that a randomly chosen car in the lot was less than 4 years old.

8. a. Sketch the graph. Shade the area of interest.



- b. Find the probability.  $P(X < 4) =$  \_\_\_\_\_

9. Out of just the cars less than 7.5 years old, find the probability that a randomly chosen car in the lot was less than 4 years old.

- a. Sketch the graph. Shade the area of interest.



- b. Find the probability.  $P(X < 4 \mid X < 7.5) =$  \_\_\_\_\_

10. Discussion question:

What has changed in the previous two problems that made the solutions different?

### QUARTILES

11. Find the average age of cars in the lot.

$$\mu = \underline{\hspace{2cm}}$$

12. Find the third quartile of ages of cars in the lot. This means you will have to find the value such that  $\frac{3}{4}$ , or 75%, of the cars are at most (less than or equal to) that age.

a. Sketch the graph. Include shading of the area of interest.



b. Find the value  $k$  such that  $P(X < k) = 0.75$ .  $k = \underline{\hspace{2cm}}$   
(Recall that you are looking for a critical value, not a probability.  
The probability is given to be 0.75.)

c. The third quartile is  $\underline{\hspace{2cm}}$ .