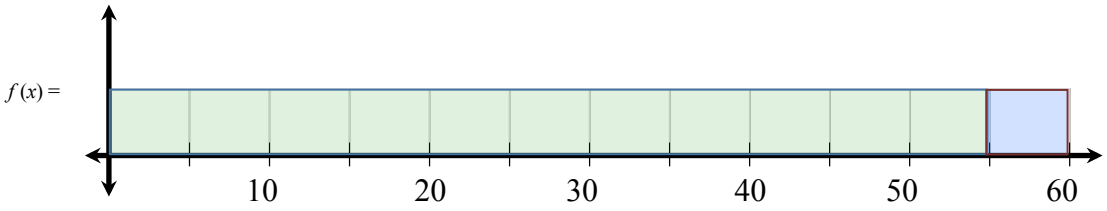
Math 14, Practice Questions for Chapters 5 and 6

Name_____

Uniform Distributions

A certain produce market sprays its produce with water for 5 seconds every minute. We can create a probability distribution graph to represent the number of seconds, x, from the beginning of the 1-minute cycle as follows:



1. Label both axes with titles. Write in the value for $f(x)$.

2. Label the regions representing the drying time and the watering time.

Define the following events as:

A = The produce is drying at time x.

B = The produce is being watered at time x.

C = A customer will have at least 15 seconds to choose vegetables before getting caught in the spray.

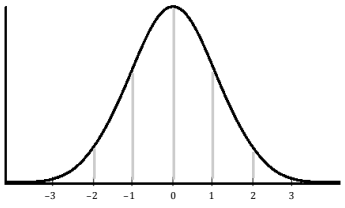
Find the following probabilities, rounded to the nearest thousandth.

3. $P(A) =$	**4.** $P(B) =$
5. $P(C) =$	**6.** $P(C \mid A) =$
7. $P(C \mid x > 30) =$	**8.** $P(C \mid 30 < x < 55) =$

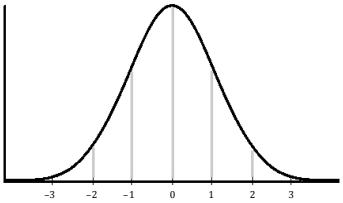
Normal Distributions

Shade each curve accordingly and label the z values. Write each z value to the nearest hundredth and each probability to the nearest thousandth.

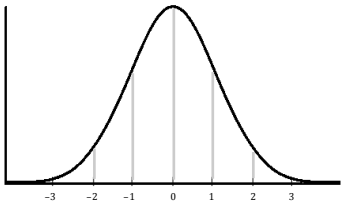
9. Find $P(-3 < z < -1)$.



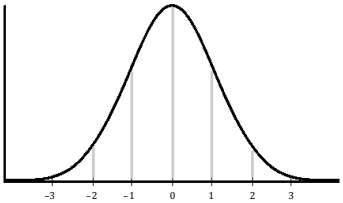
10. Find $P(-2 < z < 1)$.



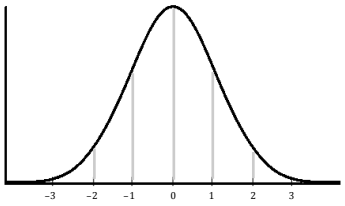
11. Find z_L for the top 5%.



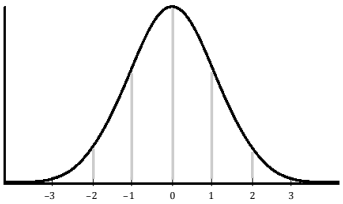
12. Find z_U for the bottom 13%.



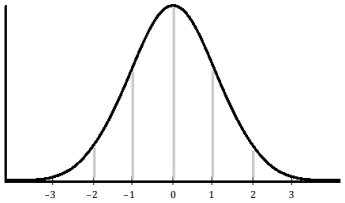
13. Find $P(z < -1.35)$.



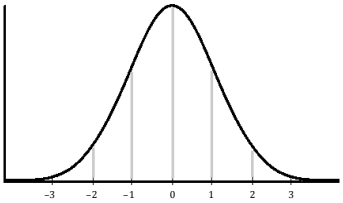
14. Find $P(z < 2.75)$.



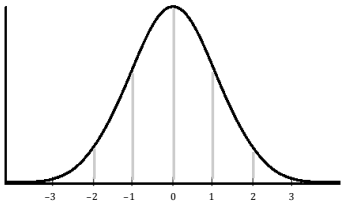
15. Find z_L and z_U for the middle 6%.



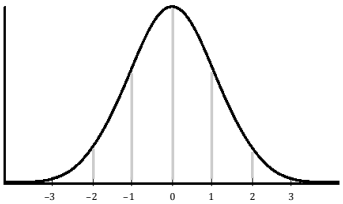
16. Find z_L and z_U for the middle 70%.



17. $X \sim N(200, 12)$. Find $P(X > 190)$



18. $X \sim N(50, 1.3)$. Find $P(X < 51)$



The mean height of 175 ROTC cadets at the Connecticut Agricutural College in 1914 is 67.3 inches, with a standard deviation of 2.7 inches. That is, $X \sim N(67.3, 2.7)$.

19. Find the probability that a randomly selected cadet has a height greater than 73 inches.

Step 1

Identify the variable values

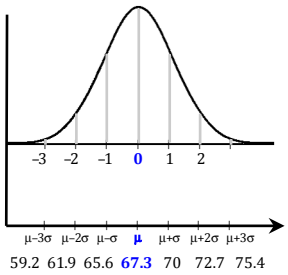
$X_L =$ $\sigma =$

$\mu =$

Step 2

Find $z_L = \dfrac{X_L - \mu}{\sigma}$

Label the X-axis with X_L, label the z-axis with z_L, and shade the appropriate region



Step 3

Use the z-table or statistics calculator to find the associated area under the normal curve

Step 4

Find the desired probability

$P(X >$ $)$

$= P(z >$ $)$

$=$

20. What is the minimum height of the tallest 2% of the cadets?

Step 1

Identify the variable values

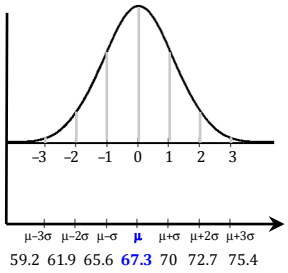
$A =$ $\mu =$

$\sigma =$

Step 2

Use the z-table or statistics calculator to find the z_A-value:

Shade the appropriate region, label the z-axis with z_A, label the X axis with the resulting X.



Step 3

Use the formula, $z_A = \dfrac{X - \mu}{\sigma}$ to solve for the desired height.