

You MUST use good notation and show appropriate work.

**Math 102**  
(Section 15.4)

Name \_\_\_\_\_

**15.4 Normal Distributions**

1. Use table 14.16 to find the percentage of the data (area under the curve) that lie in the following regions for a standard normal distribution.

a) between  $z = 0$  and  $z = 1.82$ . \_\_\_\_\_

b) between  $z = 1.32$  and  $z = 1.65$ . \_\_\_\_\_

c) between  $z = -1.3$  and  $z = 1.7$ . \_\_\_\_\_

d) to the left of  $z = 1.5$ . \_\_\_\_\_

e) to the right of  $z = 1.24$ . \_\_\_\_\_

2. Find a  $z$ -score such that

a) 30% of the area under the standard normal curve is above the  $z$  value. \_\_\_\_\_

b) 75% of the area under the standard normal curve is below the  $z$  value. \_\_\_\_\_

c) 5% of the area under the standard normal curve is below the  $z$  value. \_\_\_\_\_

3. Assume a set of data has a normal distribution with a mean of 74 and a standard deviation of 5.

a) Determine the  $z$ -score if the raw score  $x$  is

i) 89 \_\_\_\_\_

ii) 65 \_\_\_\_\_

b) Determine the value of the raw score  $x$  if the  $z$ -score is

i)  $-2.5$  \_\_\_\_\_

ii) 1.7 \_\_\_\_\_

4. Assume the weights of individual apples in a large collection of apples have a normal distribution with a mean of 9 ounces and a standard deviation of 2 ounces. What percentage of the apples weigh
- a) more than 9 ounces? \_\_\_\_\_
  - b) between 9 and 12 ounces? \_\_\_\_\_
  - c) more than 11 ounces? \_\_\_\_\_
  - d) more than 7.5 ounces? \_\_\_\_\_
  - e) between 6.8 and 8.2 ounces? \_\_\_\_\_
5. Assume that among the members at a men's gym, the distribution of body weights has a mean of 172 pounds and a standard deviation of 20 pounds. If 250 men are members of this gym, how many of them would you expect to weigh more than 200 pounds?  
\_\_\_\_\_
6. Assume a certain tire manufacturer produces a new tire. Tests show that the number of miles these tires last before blow-out has a normal distribution with mean 60,000 miles and standard deviation 4000 miles.
- a) Should they warrant their tires for 60,000 miles? Why or why not?  
\_\_\_\_\_
  - b) If they warrant their tires for 52,000 miles, what percentage of the tires would they expect to blow out while still under warranty?  
\_\_\_\_\_
  - c) How many miles should they warrant their tires for, if they are willing to pay-off on 10% of their tires?  
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