

Lesson Three Practice Assignment
Normal Distribution

1. The mean height of an action figure is 17 cm, with a standard deviation of 2 cm. Draw the normal curve to represent the normally distributed heights and answer the following questions without using a calculator. On your diagram, list the approximate percentage each area under the curve represents.
 - a. What percentage of the heights would be taller than 15 cm?
 - b. What percentage of the heights would be taller than 21 cm?
 - c. What percentage of the heights would be between 13 cm and 19 cm?
 - d. What percentage of the heights would be less than 11 cm?

2. The Bright Light Company tested a new line of photographic bulbs and found their lifetimes to be normally distributed with a mean lifetime of 98 hours and a standard deviation of 13 hours.
 - a) What percent of the bulbs last between 72 and 124 hours?
 - b) What is the probability that a randomly selected bulb will last more than 111 hours?
 - c) In a shipment of 1200 bulbs, how many would you expect to have a lifetime of less than 76 hours?

3. The Trans-Canada highway stretches from St. John's to Victoria. One section of the highway, it has been found that motorists drive at speeds that are normally distributed with a mean of 110 km/hr and a standard deviation of 16 km/hr.
 - a) What percent of the motorists are driving less than or at the posted speed limit of 100 km/hr on this section?
 - b) Ninety percent of the drivers cruise along below what speed?

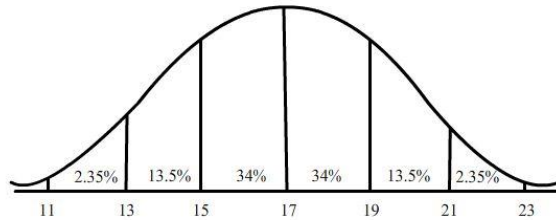
4. A random variable r is normally distributed with a mean of 5 and standard deviation of 2.5.
 - a) Find the value of w so that $P(w < r < 10) = .8413$
 - b) Find the value of w so that $P(7 < r < w) = .1000$

5. The mean and standard deviation of an entrance exam are 500 and 100 respectively. If Julie and Judy, two students who have taken the exam, are selected at random, what is the probability that:
 - a) Julie scored at least 600?
 - b) Both students scored at least 600?
 - c) At least one the two girls scored at least 600?

6. The mass of cherries grown on a farm in the Okanogan Valley are normally distributed with a mean of 7.0 grams and a standard deviation of 1.1 grams.
- Determine the interval of cherry weights symmetrical about the mean, in which you would expect the mass of 90% of the cherries to be found.
 - The smallest 10% of the cherries will not be sold. What is the minimum selling mass?
7. Students' marks on a test were normally distributed with a mean of 70 and a standard deviation of 8.
- What percent of the students obtained a mark above 80%?
 - If twenty students got a score between 60% and 70%, how many students took the test?
 - Determine the mark under which 75% of the student's marks occur. (What would be the mark for a student in the 75th percentile?)
8. In the 1940's, the batting averages in Major League Baseball were normally distributed with a mean of 0.260 and a standard deviation of 0.07. Recently the batting average has been found to be the same, but the standard deviation is now 0.05.
- What percent of players would bat over 400 (an average greater than 0.400) in each era?
 - Determine the batting average below which you would find 90% of the players in each era.

ANSWERS

- 84% would be taller than 15 cm
- 2.5% would be taller than 21 cm
- 81.5% would be between 13 cm and 19 cm
- 0.15% would be less than 11 cm



- 95.4%
- 0.1587
- 54 light bulbs
- 26.6%
- 130.5 km/hr
- 2.25
- 8.04
- 0.1587
- 0.02517
- 0.2922
- 5.2 grams-8.8 grams
- 5.6 grams
- 10.56%
- 50
- 76
- 2.28% and 0.26%
- 0.350 and 0.324