

HOMEWORK: THE NORMAL DISTRIBUTION

PROBLEM 1:

Suppose that New York State high school average scores, for students who graduate, are normally distributed with a population mean of 70 and a population standard deviation of 13.

- a) The “middle” 95% of all NYS high school students have average scores between _____ and _____ ?
- b) What proportion of NYS high school students have average scores between 60 and 75?
- c) Calculate the 14th percentile.
- d) Calculate the 92nd percentile.

PROBLEM 2 :

Suppose CUNY professors have an average life, normally distributed, of 80 years with a population standard deviation of 9 years.

- a) What percent of CUNY professors will live more than 96 years?
- b) What percent of CUNY professors will not make it past the age of 60?
- c) Calculate the 96th percentile.
- d) Calculate the 2nd percentile.
- e) What proportion of CUNY professors will live between 70 and 85 years?

PROBLEM 3:

Suppose the lifetimes of Hoover vacuum cleaners are normally distributed with an average life (μ) of 12 years and a population standard deviation (σ) of 1.4 years.

- a) What proportion of Hoover vacuum cleaners will last 14 years or more?
- b) What proportion of Hoover vacuum cleaners will last 9 years or less?
- c) What proportion of Hoover vacuum cleaners will last between 11 and 13 years?
- d) Calculate the 80th percentile.
- e) Calculate the 7th percentile.

PROBLEM 4:

Scores of high school seniors taking the English Regents examination in New York State are normally distributed with a mean of 70 and a standard deviation of 10. Find the probability that a randomly selected high school senior will have a score between 70 and 75?

PROBLEM 5:

Science scores for high school seniors in the United States are normally distributed with a mean of 60 and a standard deviation of 15. Students scoring in the top 3% are eligible for a special prize consisting of a laptop and \$5,000. What is the approximate cutoff score a student must get in order to receive the prize?

PROBLEM 6: Life of a GE Stove

The average life of a GE stove is 15.0 years (population mean) with a population standard deviation of 2.5 years.

- (a) What percentage of GE stoves will last 10 years or less?
- (b) What percentage of GE stoves will last 18 years or more?
- (c) What percentage of GE stoves will last between 16 and 20 years?
- (d) Calculate the 1st percentile
- (e) Calculate the 96th percentile

PROBLEM 7: The average wage of plumbers

The average hourly wage of plumbers is normally distributed with a population mean of \$24.00 and a population standard deviation of \$6.00. Calculate the following:

- (a) The proportion of plumbers earning between \$18 and \$22
- (b) The proportion of plumbers earning more than \$28
- (c) The proportion of plumbers earning less than \$15
- (d) The 70th percentile