

Review Problems for Exam 3

Math 1040-1

1. Find the probability that a standard normal random variable is less than 2.37.
2. Find the probability that a standard normal random variable is at least -1.04 .
3. Find the probability that a standard normal random variable is between 0.56 and 2.83.
4. Find the probability that a standard normal random variable is exactly 0.01.
5. Porphyrin is a pigment in blood protoplasm and other body fluids that is significant in body energy and storage. Let x be a random variable that represents the number of milligrams of porphyrin per deciliter of blood. In healthy adults, x is approximately normally distributed with mean 38 and standard deviation 12.
 - (a) What is the probability that x is less than 50?
 - (b) What is the probability that x is between 16 and 60?
 - (c) What is the probability that x is more than 60?
 - (d) What is the 70th percentile for the number of milligrams of porphyrin per deciliter of blood?
 - (e) What is the minimum amount of porphyrin that will be in the top 10% of observations?

6. Coal is carried from a mine in West Virginia to a power plant in New York in hopper cars on a long train. Each car has a mean weight of 75 tons and a standard deviation of 0.8 tons. The weights of the cars are approximately normal.

(a) What is the probability that a car chosen at random will have less than 74.75 tons of coal?

(b) What is the probability that 40 cars chosen at random will have a mean weight of less than 74.75 tons of coal?

(c) What is the probability that 40 cars chosen at random will have a mean weight of at least 75.8 tons of coal?

7. The *Denver Post* stated that 80% of all new products introduced in grocery stores are taken off the market within 2 years. If a grocery chain introduces 66 new products, what is the probability that within 2 years

(a) 47 or more fail?

(b) 58 or fewer fail?

(c) 15 or more succeed?

(d) fewer than 10 succeed?

8. The number of days each year that the Salt Lake City National Weather Service Office's forecast has been off by at least 10 degrees Fahrenheit are:

Year	1950	1960	1970	1980	1990	2000	2010
Number of Days	55	41	23	13	8	9	3

- (a) Draw a scatter plot for the above data.
- (b) Is the linear correlation positive, negative, or neither? Explain.
- (c) Find the correlation coefficient, r .
- (d) Write the equation of the regression line and sketch the line on the scatter plot from part 8a.
- (e) Predict the number of days the SLC NWS's forecast will be off by at least 10 degrees in 2020.
- (f) Calculate the residual for the 2010 observation.