

Normal Distribution Formative Assessment

1) Suppose the systolic blood pressure of an adult male is normally distributed with a mean of 138 mm of mercury and standard deviation of 10. If an adult male is picked at random, find the percentage of men whose systolic blood pressure will be... $N(138, 10)$

a. greater than 160 mm = .0139

b. between 120 and 135 mm = .3462

c. less than 110 mm = .0026

d. between 130 and 140 mm = .3674

Find the systolic blood pressure for men that represents (Working Backwards):

e. the 99th percentile

$$161.26$$

f. the 99.5th percentile

$$163.76$$

g. the top 0.01 percent

$$175.19$$

h. the bottom 0.5 percent

$$112.24$$

2) The shelf life of milk (properly refrigerated) is normally distributed with a mean of 9 days and standard deviation of 2.8 days. If a gallon of milk is randomly selected what percentage of milk

$$N(9, 2.8)$$

a. will last more than 2 weeks

$$P(X > 14) = .0371$$

b. will go bad within a week

$$P(X < 7) = .2375$$

c. will last between 1 and 2 weeks

$$P(7 < X < 14) = .7254$$

d. will last between 8 and 10 days

$$P(8 < X < 10) = .2790$$

Find the milk shelf length that represents (Working Backwards):

e. the 90th percentile

$$12.6 \text{ DAYS}$$

f. the 99.9th percentile

$$17.7 \text{ DAYS}$$

g. the top 3 percent

$$14.3 \text{ DAYS}$$

h. the bottom 1 percent

$$2.5 \text{ DAYS}$$

$$N(4.65, 1.24)$$

3.) In a city parking lot, the average age of a car is 4.65 years old with a standard deviation of 1.24 years. Assuming the distribution of cars is normal. If a car is chosen at random, find the percentage of cars that are.....

a. older than 5 years

$$P(X > 5) = \boxed{.3889}$$

b. newer than 2 years

$$P(X < 2) = \boxed{.0163}$$

c. between 3 and 6 years old

$$P(3 < X < 6) = \boxed{.7702}$$

Find the car age that represents (Working Backwards):

d. the 85th percentile

$$\text{invNorm}(.85, 4.65, 1.24) = \boxed{5.9 \text{ yrs old}}$$

e. the oldest 2%

$$\text{invNorm}(.98, 4.65, 1.24) = \boxed{7.2 \text{ yrs old}}$$

4.) Joan found that her average telephone call last month was 9.6 minutes with a standard deviation of 2.4 minutes. Her telephone call usage was roughly normal. What percentage of her calls...

$$N(9.6, 2.4)$$

a. were less than 5 minutes?

$$P(X < 5) = \boxed{.0276}$$

b. were less than 10 minutes?

$$P(X < 10) = \boxed{.5662}$$

c. were more than 15 minutes?

$$P(X > 15) = \boxed{.0122}$$

d. were between 4 and 8 minutes?

$$P(4 < X < 8) = \boxed{.2427}$$

Find the telephone call length that represents (Working Backwards):

e. the 90th percentile

$$\text{invNorm}(.90, 9.6, 2.4) = \boxed{12.7 \text{ min}}$$

f. the top 0.5 percent

$$\text{invNorm}(.995, 9.6, 2.4) = \boxed{15.8 \text{ min}}$$

h. the bottom 1%

$$\text{invNorm}(.01, 9.6, 2.4) = \boxed{4.0 \text{ min}}$$