

Statistical Reasoning
Normal Distribution

Name: _____ Date: _____ Class: _____

Normal Distribution Practice

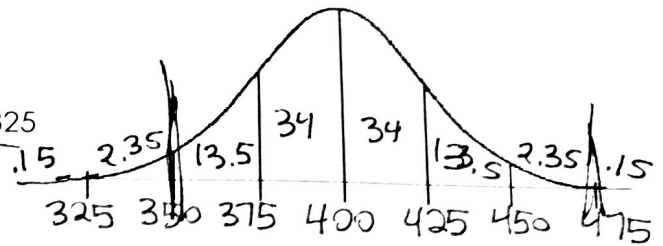
1. A few months ago, Super Star Sam picked up a new iPhone 6S. As he was listening to it on the train Tuesday, he wondered how much longer his battery will last. After a quick online search, he discovered that the expected battery life for a 6S is 400 full charges with a standard deviation of 25 and the distribution is Normally distributed.

a. What percent of the 6Ss can recharge at least 450 times?

$2.35 + .15 = 2.5\%$

b. What percent of the 6Ss can recharge less than 325 times?

15%



c. In a box of 200 6Ss, how many of those are likely to recharge between 350 and 475 times?

97.35% $200 \times .9735 = 194.7 = 195 \text{ phones}$

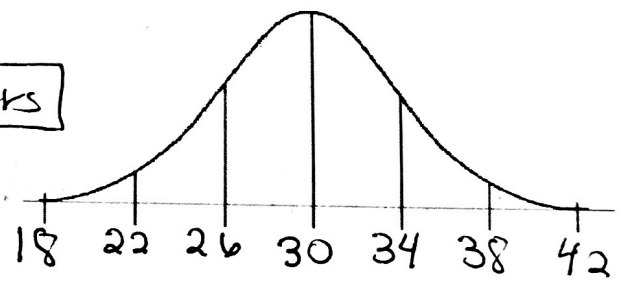
2. The mean gas mileage for cars driven by the students at North Cobb High School is 30 miles per gallon, and the standard deviation is 4 miles per gallon. Assume that the gas mileages are normally distributed. Today there are 350 cars in the parking lot.

a. How many of the cars have gas mileages between 22 and 34 miles per gallon?

$34 + 34 + 13.5 = 81.5\%$ $350(.815) = 285 \text{ cars}$

b. How many of the cars have gas mileages greater than 34 miles per gallon?

$13.5 + 2.35 + .15 = 16\%$ $350(.16) = 56 \text{ cars}$



c. How many of the cars will have a gas mileage of at most 26 miles per gallon?

$13.5 + 2.35 + .15 = 16\%$
 $350(.16) = 56 \text{ cars}$

3. A person's blood glucose level and diabetes are closely related. After a 12-hour fast, the random variable x will have a distribution that is approximately Normal with a mean of 85 and standard deviation of 25 for people under the age of 50.

a. What percentage of people under 50 have a blood glucose level less than 60 milligrams per deciliter?

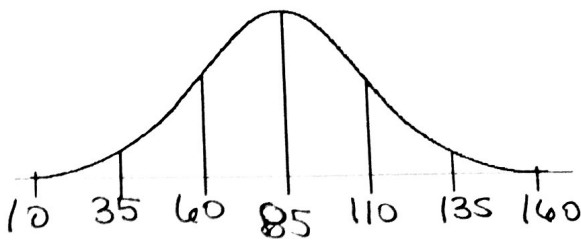
$$13.5 + 2.35 + .15 = 16.6\%$$

b. What percent have a blood glucose level greater than 110 milligrams per deciliter?

$$100 - 16.6 = 83.4\%$$

c. What percent having a blood glucose level greater than 135 milligrams per deciliter (borderline diabetes starts at 140)?

$$2.35 + .15 = 2.5\%$$



The quality control inspector for a bagel shop periodically checks the calorie content of the bagels. The inspector has determined that the multi-grain bagels have a mean of 300 calories and a standard deviation of 10 calories. The inspector has determined that the calories are normally distributed.

a. What percent of the multi-grain bagels have a caloric content between 270 and 330?

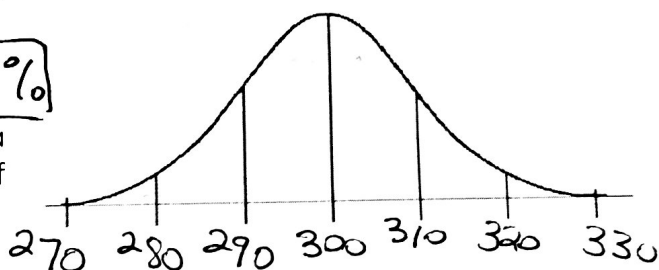
$$2.35 + 13.5 + 34 + 34 + 13.5 + 2.35 = 99.7\%$$

b. What percent of the multi-grain bagels have a caloric content within two standard deviations of the mean?

$$95\%$$

c. If the inspector grabs 523 bagels, how many are likely to have a caloric content at least 280 calories?

$$97.5\% \cdot 523 = 510 \text{ bagels}$$



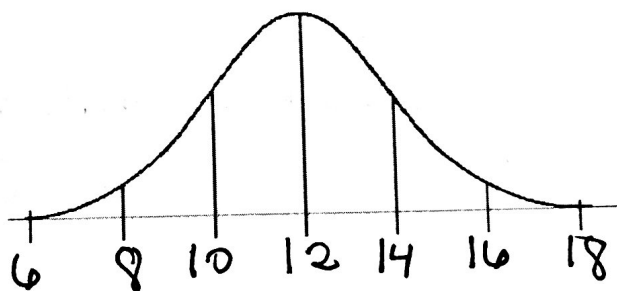
response times for a certain ambulance company are normally distributed, with a mean of 12 minutes. Ninety-five percent of the response times are between 8 and 16 minutes.

a. What is the standard deviation of the response times?

$$\sigma = 2$$

b. What percent of the response times are longer than 18 minutes?

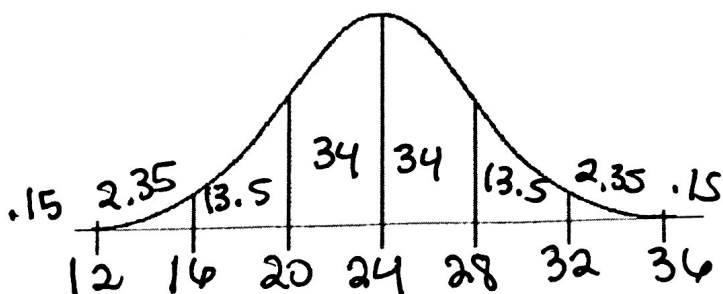
$$1.15\%$$



North Cobb had 500 juniors took the ACT last year. The scores are distributed normally with a mean of 24 and a standard deviation of 4. Label the graph and fill in the percentages.

a. What percentage of scores are between 20 and 28?

$$68\%$$



b. What percentage of scores is greater than a score of 24?

50%

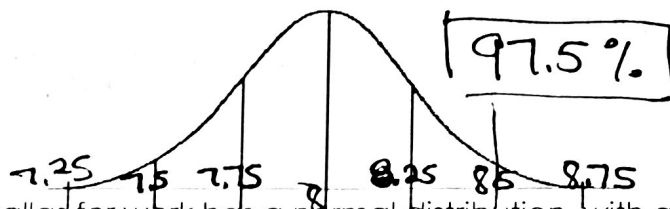
c. Approximately how many juniors scored between 24 and 28?

$.34(500) = 170$ juniors

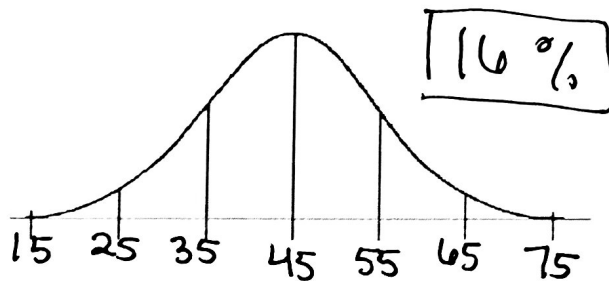
d. Approximately how many juniors scored higher than 32?

$.025(500) = 12.5$ 13 juniors

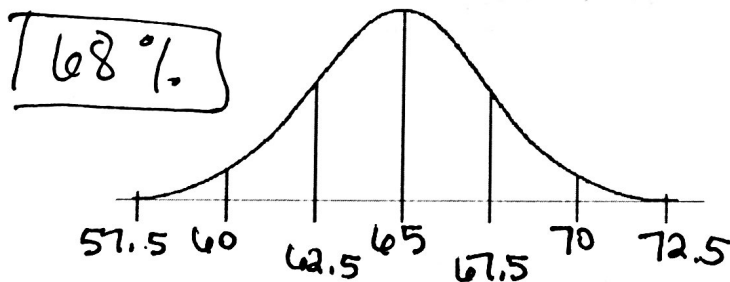
7. You go to Double Dip for a single serving. Their normal distribution is 8 ounces, with a standard deviation of $\frac{1}{4}$ oz. Suppose your serving weighs 8.5 ounces, what percentage of servings are smaller than yours?



8. Mary's commute to Dallas for work has a normal distribution, with a mean of 45 minutes and a standard deviation of 10 minutes. What percentage of the time does Mary get to work in 30 minutes or less?

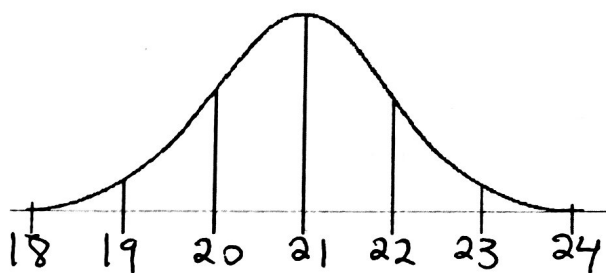


Assume that the heights of college women are normally distributed, with mean 65 in. and standard deviation 2.5 in. What percentage of women are between 62.5 in. and 67.5 in.?



The incubation time for Rhode Island Red chicks is normally distributed with mean 21 days and standard deviation approximately 1 day. If 1000 eggs are being incubated, how many chicks do we expect will hatch in 19 to 23 days?

$.95(1000) = 950$ chicks



11. At Burnt Mesa Pueblo, archaeological studies have used the method of tree ring dating in an effort to determine when prehistoric people lived in the pueblo. Wood from several excavations gave a mean of (year) 1243 with standard deviation 36 years. The distribution of dates was more or less normal.

a. Estimate the range of years centered about the mean in which about 68% of the data will be found.

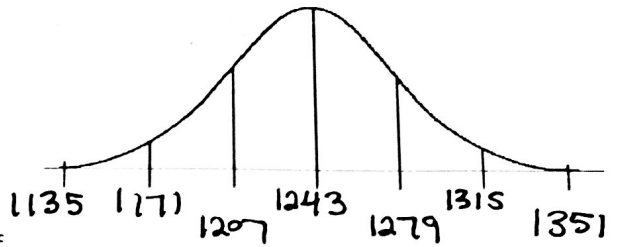
1207 to 1279

b. Estimate a range of years centered about the mean in which about 95% of the data will be found.

1171 to 1315

c. Estimate a range of years that the lower 16% of the data will be found

Before 1207



12. A vending machine automatically pours soft drinks into cups. The amount of soft drink dispensed into a cup is normally distributed with mean 7.6 oz and standard deviation of 0.4 oz.

a. Estimate the probability that the machine will overflow an 8-oz cup.

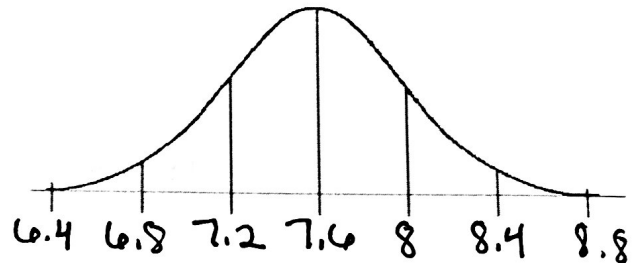
16%

b. Estimate the probability that the machine will not overflow an 8-oz cup.

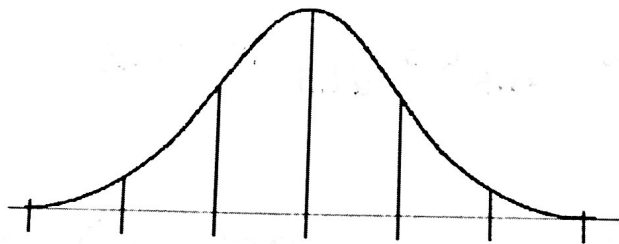
84%

c. The machine has just been loaded with 850 cups. How many of these do you expect will overflow when served?

$0.16(850) =$ 136 cups



13. Times to complete the statistics exam have a normal distribution with a mean of 40 minutes and a standard deviation of 6 minutes. Perry is at the 90th percentile, what percentage of students are still working when he is finished?



Jules sleeps an average of 8 hours a night, with a standard deviation of 15 minutes. What's the chance he will sleep less than 7 1/2 hours tonight?

2.5%

