Module 7 Review Name:_____

Int. Math 3 Honors Period: _____

1. $\boldsymbol{A} = \{\mathbf{11}, \mathbf{12.5}, \mathbf{13}, \mathbf{9}, \mathbf{12.5}\}$ $\boldsymbol{B} = \{\mathbf{1.2}, \mathbf{2.1}, \mathbf{1.8}, \mathbf{1.7}, \mathbf{1.9}\}$

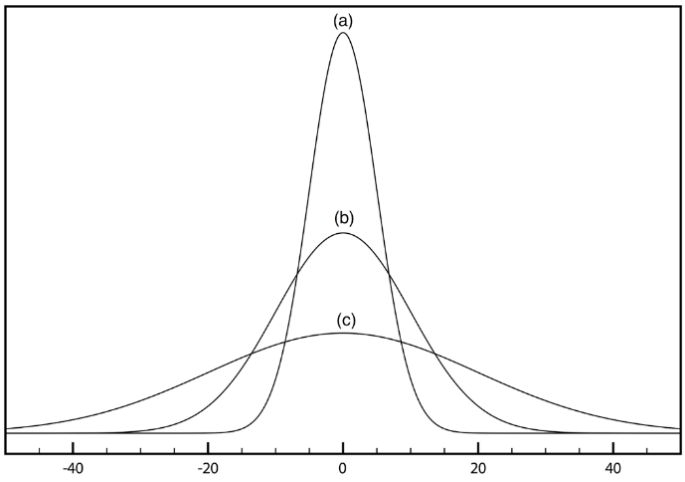
a. Find the standard deviation of each set.

b. What is one standard deviation above A? Two below B?

c. Create a modified box plot for **A**.

d. Sketch a normal distribution curve for **B**. Assuming **B** is normal

2. Estimate the standard deviation for each



3. Does a larger standard deviation make the curve more wide or more narrow?

4. Explain the difference between a standard deviation of 1.2 versus a standard deviation of 34.

5. The population of CCA students' heights is normally distributed with a mean of 5'5" and a standard deviation of 5.7 inches. Mr. Happ is considered unusually tall for his high school at 6' 5".

a. What percent of CCA students are taller than Mr. Happ?

b. How tall would Mr. Happ have to be in order to be in the top 1% of CCA students' heights?

c. What percentage of students are between 5'1'' and 6'4''?

d. How tall does a student have to be in order to be above 87% of the population?

6. Mr. Euler makes a mean monthly income of $10,500 with a standard deviation of $1,600. In one given month, Mr. Euler makes $8,500.

a. Find the z-score.

b. Assuming Mr. Euler's monthly income follows a normal distribution, what percent of the time does he make more than this amount? Less than this amount?

c. What percent of the time does he make between $8,000 and $12,000?

d. What percent of the time does he make less than $8,500 or greater than $11,000?

e. If he needs to make $13,500, how likely in a given month is he to do this?

7. Mr. Mueller wants to know the average height of the students in his school. There are 2089 students in his high school; he finds the heights of 27% of them.

Population: Sample: Parameter:

8. Hector randomly selects 10 different tables in the lunchroom and surveys every student at the table to determine if students at the school are satisfied with school lunch.

Type of sample: Representative? Explain:

9. Hector surveys the first 75 students in the lunch line to determine if students at the school are satisfied with school lunch.

Type of sample: Representative? Explain:

10. Hector selects every 9th student in the lunch line to determine if students at the school are satisfied with school lunch.

Type of sample: Representative? Explain:

11. Create scenarios for the other three types of samples.

Type of sample: Representative? Explain:

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12. Identify each situation as a survey, observational study, or an experiment.

a. Stark Industries wants to know what their customer satisfaction is. They randomly select 123 customers and ask them.

b. To determine if the new Nike Frees make you run faster, the Nike team randomly assign people into two groups: Group 1 receives Nike Frees and group 2 receives a placebo (look-alike shoe). Both groups are timed and the results are compared.

c. To determine whether exercise raises test scores, researchers randomly selected a group of participants and recorded the number of hours each participant exercised and the rise or fall of their test scores.

13. Provide an example for each of the following:

a. Simple random sample

b. Cluster random sample

c. Systematic random sample

d. Stratified random sample

14. Solve the following:

a. $3\cot^2 x - 1 = 0$

b. $2\sin^2 3x + 5\sin 3x = 3$

c. $2\tan^2 \frac{x}{4} - \tan \frac{x}{4} - 6 = 0,$

d. $\sec x \sin x - 3\sin x = 0$

AP Statistics **Worksheet on Normal Distribution** **Name:_____**

For each question, construct a normal distribution curve and label the horizontal axis. Then answer each question.

1. The mean life of a tire is 30,000 km. The standard deviation is 2000 km.

a) 68% of all tires will have a life between _____ km and _____km.
b) 95% of all tires will have a life between _____ km and _____ km.
c) What percent of the tires will have a life that exceeds 26,000 km?
d) If a company purchased 2000 tires, how many tires would you expect to last more than 28 000 km?

2. The shelf life of a particular dairy product is normally distributed with a mean of 12 days and a standard deviation of 3 days.

a) About what percent of the products last between 9 and 15 days?
b) About what percent of the products last between 12 and 15 days?
c) About what percent of the products last 6 days or less?
d) About what percent of the products last 15 or more days?

3. A line up for tickets to a local concert had an average (mean) waiting time of 20 minutes with a standard deviation of 4 minutes.

a) What percentage of the people in line waited for more than 28 minutes?
b) If 2000 ticket buyers were in line, how many of them would expect to wait for less than 16 minutes?

4. On a recent math test, the mean score was 75 and the standard deviation was 5. Mike made 93. Would his mark be considered an outlier if the marks were normally distributed? Explain.

5. In an Oreo factory, the mean mass of a cookie is given as 40 g. For quality control, the standard deviation is 2 g.

a) If 10,000 cookies were produced, how many cookies are within 2 g of the mean?
b) Cookies are rejected if they weigh more than 44 g or less than 36 g. How many cookies would you expect to be rejected in a sample of 10,000 cookies?

6. The speeds of cars on the highway have a mean of 95 km/h with a standard deviation of 5 km/h.

a) What percentage of cars averaged less than 85 km/h?
b) If a police car stopped cars that were going more than 105 km/h, how many cars would they stop if there were 8000 cars on the highway?

7. The Floppy Disk Company makes 3.5 inch floppy disks for disk drives that are 3.7 inches wide. The size of a manufactures disk is normally distributed with a standard deviation of 0.1 inches. The company manufactures 1000 disks every hour.

a) What % of the disks would you expect to be greater than 3.5 inches?
b) In one hour, how many disks would you expect to be between 3.4 inches and 3.7 inches?
c) About how many disks will be unable to fit in the disk drive (3.7 inch won't fit)?

8. The mean life of a battery is 50 hours with a standard deviation of 6 hours. The manufacturer advertises that they will replace all batteries that last less than 38 hours. If 50,000 batteries were produced, how many would they expect to replace?

9. A bottle of fruit punch contains at least 473 ml. The machine that fills the bottles is set so that the mean volume is 477 ml. The volumes in the bottles are normally distributed.

a) What percent of the bottles are underfilled if the standard deviation is 2 ml?
b) What percent of the bottles are underfilled if the standard deviation is 4 ml?

10. A grading scale is set up for 1000 students' test scores. It is assumed that the scores are normally distributed with a mean score of 75 and a standard deviation of 15

a) How many students will have scores between 45 and 75?
b) If 60 is the lowest passing score, how many students are expected to pass the test?

11. The monthly income of 5,000 workers at the Microsoft plant are distributed normally. Suppose the mean monthly income is $1,250 and the standard deviation is $250.

a) How many workers earn more than $1500 per month?
b) How many workers earn less than $750 per month?
c) What percentage of the workers earn between $750 and $1500 per month?
d) What percentage of the workers earn less than $1750 per month?