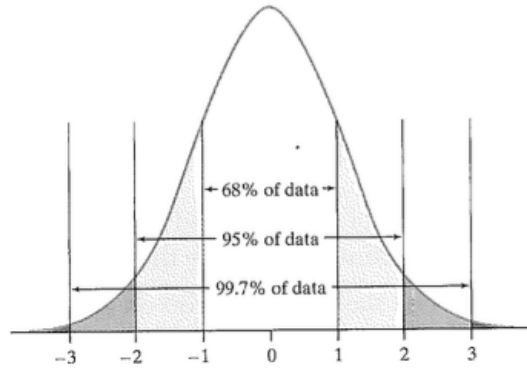


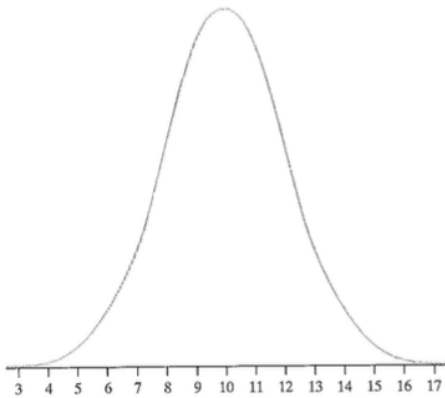
Algebra 1 – Statistics Questions on the Normal Distribution Name _____

Goals: bell curve, center, and spread

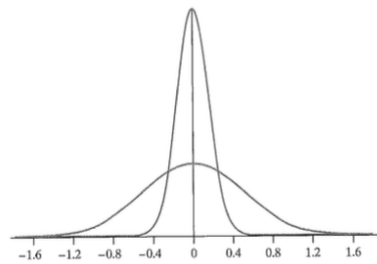
Notes: The graph below is a bell curve. When data takes this form, it is said to be normally distributed. The peak of the graph is the mean. In the graph below, the mean is 0. The spread of the curve is described by the standard deviation (average distance the data values fall from the mean). The curve below has standard deviation of 1. The curvature changes at the first standard deviation.



46. A Normal curve Estimate the mean and standard deviation of the Normal density curve in the figure below.



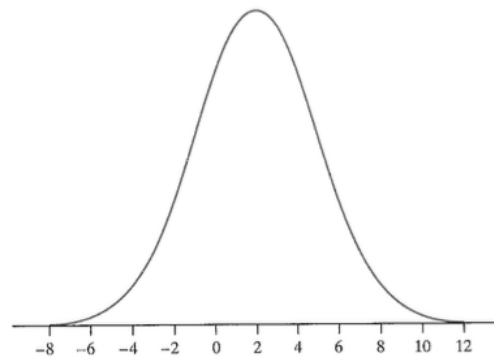
Estimate the mean and standard deviation for BOTH curves below:



69. Which of the following is *least* likely to have a nearly Normal distribution?

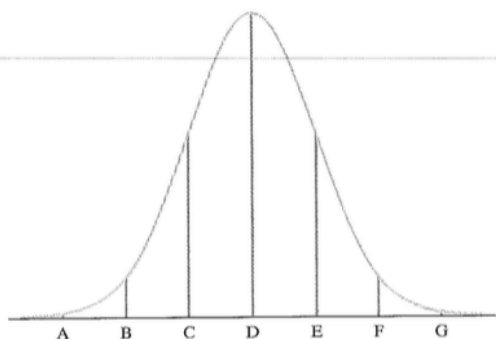
- (a) Heights of all female students taking STAT 001 at State Tech.
- (b) IQ scores of all students taking STAT 001 at State Tech.
- (c) SAT Math scores of all students taking STAT 001 at State Tech.
- (d) Family incomes of all students taking STAT 001 at State Tech.
- (e) All of (a)–(d) will be approximately Normal.

T2.2. For the Normal distribution shown, the standard deviation is closest to



- (a) 0 (b) 1 (c) 2 (d) 3 (e) 5

Exercises 70 to 72 refer to the following setting. The weights of laboratory cockroaches follow a Normal distribution with mean 80 grams and standard deviation 2 grams. The figure below is the Normal curve for this distribution of weights.



70. Point C on this Normal curve corresponds to
 (a) 84 grams. (c) 78 grams. (e) 74 grams.
 (b) 82 grams. (d) 76 grams.
71. About what percent of the cockroaches have weights between 76 and 84 grams?
 (a) 99.7% (c) 68% (e) 34%
 (b) 95% (d) 47.5%
72. About what percent of the cockroaches have weights less than 78 grams?
 (a) 34% (c) 16% (e) none of these
 (b) 32% (d) 2.5%

49. **Do women study more than men?** We asked the students in a large first-year college class how many minutes they studied on a typical weeknight. Here are the responses of random samples of 30 women and 30 men from the class:

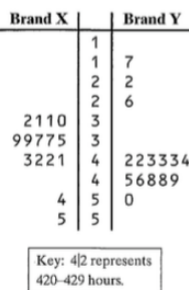
Women					Men				
180	120	180	360	240	90	120	30	90	200
120	180	120	240	170	90	45	30	120	75
150	120	180	180	150	150	120	60	240	300
200	150	180	150	180	240	60	120	60	30
120	60	120	180	180	30	230	120	95	150
90	240	180	115	120	0	200	120	120	180

33. **Marginal distributions aren't the whole story** Here are the row and column totals for a two-way table with two rows and two columns:

<i>a</i>	<i>b</i>	50
<i>c</i>	<i>d</i>	50
60	40	100

Find *two different* sets of counts *a*, *b*, *c*, and *d* for the body of the table that give these same totals. This shows that the relationship between two variables cannot be obtained from the two individual distributions of the variables.

T1.14. The back-to-back stemplot shows the lifetimes of several Brand X and Brand Y batteries.



Apply Your Knowledge To The Class Data 12

Be creative! Choose two topics from the data collected that you think might show a link.

Example: Are students who have visited Indiana more likely to steal?

Use different variables than #11

Create a two-way table comparing your two topics and discuss your findings.

Apply Your Knowledge To The Class Data 13

Step 1: input the homework hours and TV/streaming hours for the class into the calculator.

Step 2: create a linear equation that predicts texts based on homework hours:

$$\text{TV Hours} = \underline{\hspace{2cm}} \cdot \text{HW Hours} + \underline{\hspace{2cm}} \qquad r = \underline{\hspace{2cm}}$$

Describe the slope in context:

Describe the y-intercept in context:

Describe the relationship, including the strength.

Step 3: sketch the data and line for the class

Step 4: predict the texts for a person who completed 2 hours of homework

Step 5: predict the homework hours for a person who sent 80 texts

Step 6: Calculate the following statistics for the two data sets:

	TV Hours	Streaming Hours
5 Number Summary		
Range and IQR		
Mean and Standard Deviation		
Box Plot and Dot Plot		
Does the Dot Plot appear Normally Distributed? Explain.		
Is the dot plot centered at the mean?		