Algebra 2 **Name**_____
9.1 Worksheet **If needed, round answers to the nearest tenth.**

1) Frederick takes four tests in his history class. The first three test scores are 80, 72, and 79. What would he need to score on his fourth test in order to have a mean (an average) of 82 for his tests?

For #2 – 4: A quiz is given to 14 students, with the results below.

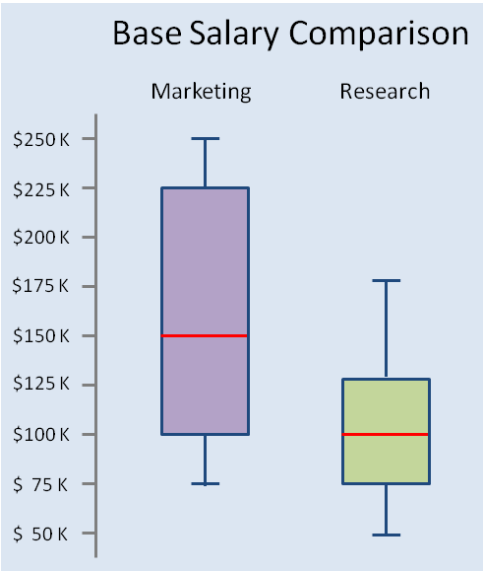
5, 5, 5, 6, 6, 6, 7, 7, 7, 8, 8, 9, 10, 10

2) Find the mean and mode of the quiz scores.

3) Find the median and range of the quiz scores.

4) A 15th student is given the quiz, and earns a score of 2. Which measure of center is changed the most by this new score; the mean, the median, or the mode?

5) Use the box plots in the diagram to the right to compare salaries (in thousands of dollars) for people in marketing jobs and people with researching jobs.



a) Find the IQR (Interquartile Range) for the **marketing** box plot.

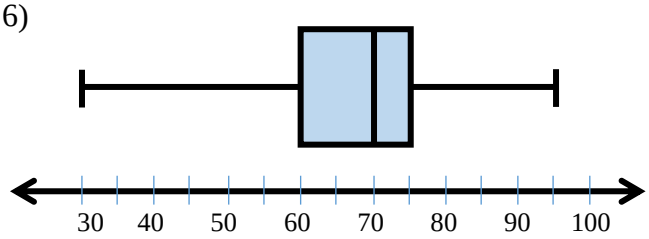
b) Find the difference between the ranges for the two box plots.

c) Approximately what percentage of people with research jobs earn between $100,000 and $125,000 per year?

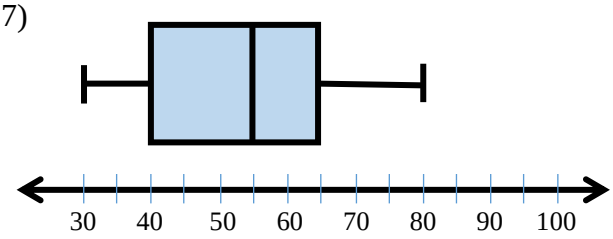
d) The mean base salary for people with marketing jobs is $167,000 per year. How much more is this than the median for people with marketing jobs?

For #11 – 12: For the following box-and-whisker plots, calculate the fences for possible outliers.

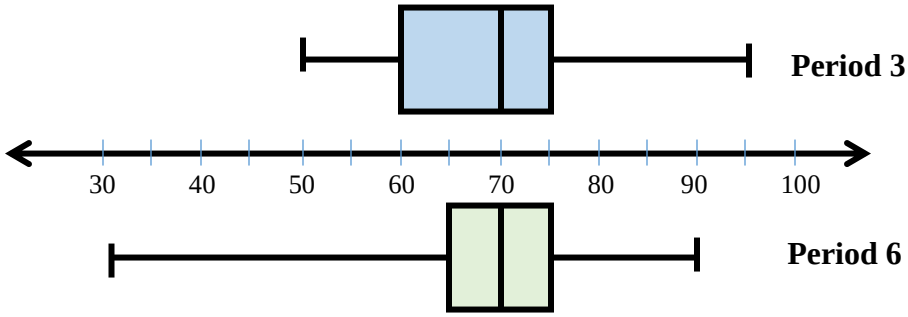
6)



7)



For #8 – 11: use the box plots below, comparing test scores for two classes.



8) True or false? Period 3 has a smaller IQR than period 6.

9) For Period 3, what percentage of students scored between 70 and 95 on the test?

10) For Period 6, what percentage of students scored between 65 and 90 on the test?

11) Which class had the highest score?

12) A substitute teacher kept track of how long it took her to get to her assigned schools each day, and she made this stem-and-leaf plot of her data. Which statement(s) comparing mean and median are true?
(Hint: Make a conjecture then calculate the mean and median to test it if you're not sure.)

1	0 0 2 3 4 4 5 8
2	1 2 6 7
3	1 4
4	7

Key: 1|0 = 10

A. The **mean is higher** because the really high value at the end pulls it up.
B. The **median is higher** because the really high value at the end pulls it up.
C. The **mean is lower** because most of the values are small.
D. The **median is lower** because most of the values are small.
E. The **mean and median are the same** because they are always equal.

Algebra 2 **Name_____**
9.2 Worksheet **If needed, round answers to the nearest tenth.**

For #1 – 5, use a graphing calculator and the list of number of employees in various local businesses:

6, 9, 11, 8, 5, 14, 12, 10, 7, 8, 2, 11, 10, 8, 6

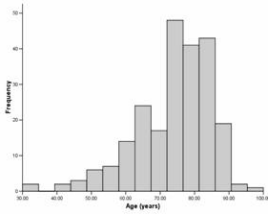
1) Find the mean and the standard deviation.

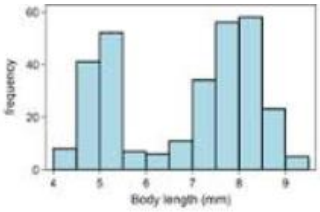
2) Identify any outliers by using the mean and standard deviation.

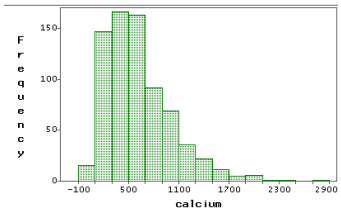
3) Create a histogram on a graphing calculator. Describe the shape of the distribution.

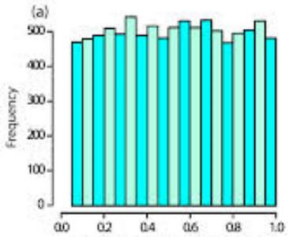
4) Which is larger, the mean or the median?

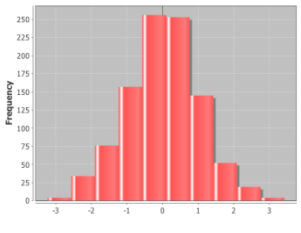
For #5 – 9, describe the shape of each distribution.

5) 

6) 

7) 

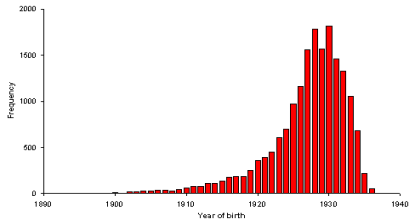
8) 

9) 

10) Given a set of data with a mean of 86 and a standard deviation of 13, which of the following values, if any, are outliers? 61, 59, 106, 111, 101, 113

11) Given a set of data with the following information: median = 15, Q1 = 12, Q3 = 18, lower extreme = 4, and there are no outliers in the list. What is the highest value that the upper extreme can be?

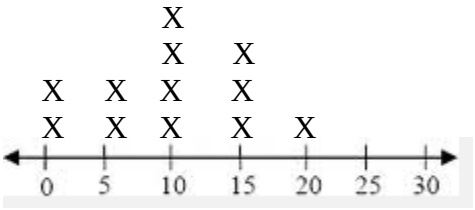
12) A distribution is skewed left, as shown. Which is likely to be a larger value, the mean or the median?



13) The mean IQ of adults is 100, with a standard deviation of 15. Which of the following people have IQs that are outliers, if any?

Tricia: 124
Natalie: 120
Sandy: 131
Bill: 129

For #14 – 16: A carnival wants to ensure that each game gives out enough prizes to keep customers entertained, while not giving out too many prizes, because then the game would lose money. The line plot to the right shows the number of prizes that various games at a carnival gave away in one day.



14) Find the median number of prizes given out.

15) What is the mode?

16) What is the mean number of prizes?

17) Identify the VA and HA: $y = \frac{3x-2}{4x+8}$

18) When entering grades for report cards, a math teacher notices that two students have identical mean scores. The teacher also noticed that Student X had a standard deviation of 18.6, while Student Y had a standard deviation of 3.4. Which statement must be true?

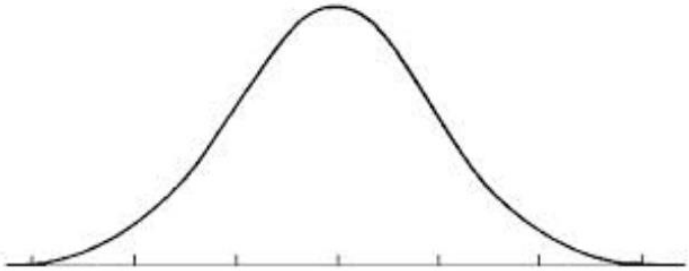
A) The grades of Student Y were more consistent that the grades of Student X.
B) Student Y had lower grades than Student X.
C) The median of Student Y's grades is lower than the median for Student X's grades.
D) Student Y had more failing grades than Student X.

19) A student in a statistics course wants to determine how many students in the school have after school jobs. Which of the following surveys would give the best representation of the school's population?

A) Go to the mall in the evening and ask how many employees attend your school.
B) Give 30 randomly selected freshmen, 30 randomly selected sophomores, 30 randomly selected juniors, and 30 randomly selected seniors a questionnaire asking them if they have jobs.
C) Give all of the seniors a questionnaire asking them if they have jobs.
D) Go to a football game after school and ask all of the students attending if they have jobs.

Algebra 2 **Name**_____
9.3 Worksheet

For #1 – 5, the mean weight of an infant elephant calf is 225 pounds, with a standard deviation of 45 pounds.



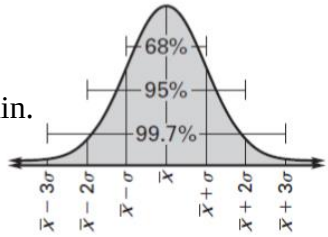
1) What percentage of infant elephant calves weighs between 180 and 315 pounds?

2) What percentage of infant elephant calves weighs less than 135 pounds?

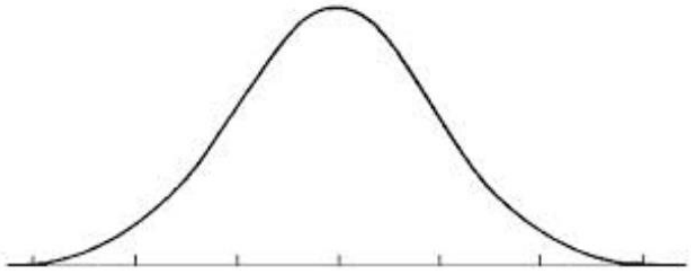
3) What percentage of infant elephant calves weighs more than 225 pounds?

4) A baby elephant born at the Denver Zoo weighs 318 pounds. Is this weight an outlier? Explain.

5) A baby elephant born in the wild weighs 138 pounds. Is this weight an outlier? Explain.



For #6 – 11, the mean weight of adult men is 172 pounds, with a standard deviation of 29 pounds.



6) What is the probability than an adult man weighs more than 201 pounds?

7) What is the probability than an adult man weighs between 143 pounds and 172 pounds or above 201?

8) What is the probability that an adult man weighs less than 230 pounds?

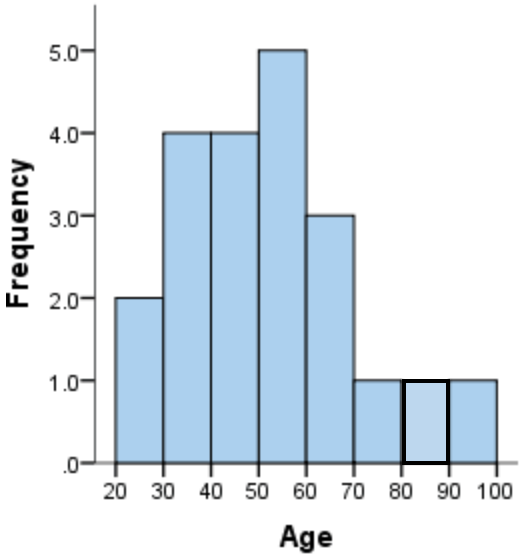
9) Is a weight of 142 pounds an outlier? Explain.

10) What is the percentile rank for an adult man weighing 201 pounds?

11) If 300 men are randomly chosen, approximately *how many* of them will weigh between 143 and 201 pounds?

For #12 – 18, the ages of people in a store are collected and are displayed in the histogram shown.

12) How many people were in the store when the data was collected?



13) What is the mode age category?

14) In what category is the median?

15) Describe the shape of the distribution.

16) How many people are between the ages of 30 years and 70 years?

17) How many people are greater than 70 years old?

18) How many people are less than 40 years old?

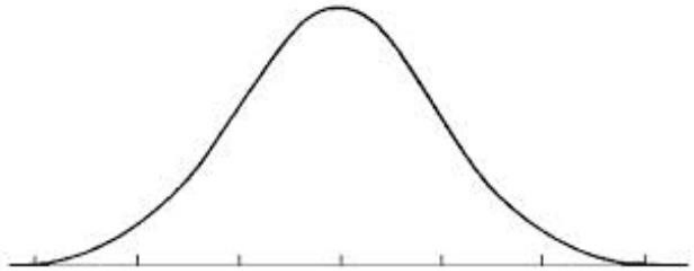
19) Given a normal distribution of women's heights with a mean of 5 feet 6 inches, which value is least probable?

A. 5 feet 6 inches
B. 5 feet 10 inches
C. 6 feet 2 inches
D. 4 feet 11 inches

20) Describe the transformation of $y = -2\sqrt{x-3} + 6$ from the parent function $y = \sqrt{x}$.

Algebra 2 **Name_____**
9.4 Worksheet **If needed, round answers to the nearest tenth.**

For #1 – 7: The mean height of adult American males is 70 in, with a standard deviation of 3 in.



1) Find the z-score for a height of 66 inches.

2) Find the probability that an adult American male is less than 66 inches tall.

3) Find the probability that an adult American male is more than 66 inches tall.

4) Find the z-score for a height of 72 inches.

z	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
−2	.0228	.0179	.0139	.0107	.0082	.0062	.0047	.0035	.0026	.0019
−1	.1587	.1357	.1151	.0968	.0808	.0668	.0548	.0446	.0359	.0287
−0	.5000	.4602	.4207	.3821	.3446	.3085	.2743	.2420	.2119	.1841
0	.5000	.5398	.5793	.6179	.6554	.6915	.7257	.7580	.7881	.8159
1	.8413	.8643	.8849	.9032	.9192	.9332	.9452	.9554	.9641	.9713
2	.9772	.9821	.9861	.9893	.9918	.9938	.9953	.9965	.9974	.9981

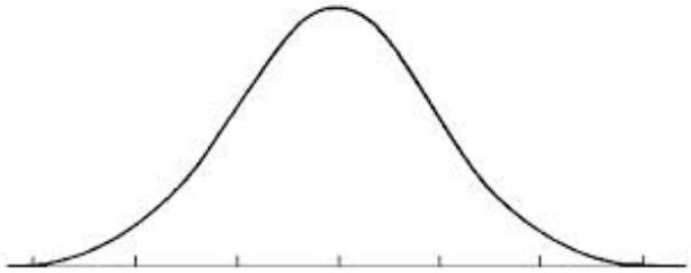
5) Find the probability that an adult American male is less than 72 inches tall.

6) Find the probability that an adult American male is more than 72 inches tall.

7) Find the probability than an adult American male is *between* 66 and 72 inches tall.

8) A student scored 98, 84, and 90 on three exams this semester. This is one exam remaining. What score does the student need to achieve on the last exam to have a mean of 88 on his exams?

For #9 – 13: In 2011, the mean score of the math portion of the SAT is 518, with a standard deviation of 115.



9) Find the z-score for 500.

10) What is the probability that a student scored less than 500 on the math portion of the SAT?

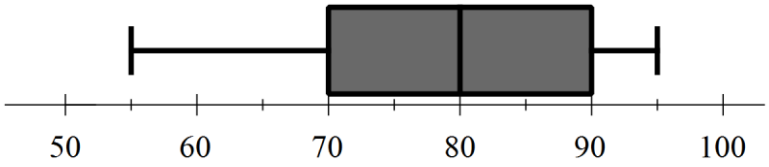
11) What is the probability that a student scored more than 500 on the math portion of the SAT?

z	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
−2	.0228	.0179	.0139	.0107	.0082	.0062	.0047	.0035	.0026	.0019
−1	.1587	.1357	.1151	.0968	.0808	.0668	.0548	.0446	.0359	.0287
−0	.5000	.4602	.4207	.3821	.3446	.3085	.2743	.2420	.2119	.1841
0	.5000	.5398	.5793	.6179	.6554	.6915	.7257	.7580	.7881	.8159
1	.8413	.8643	.8849	.9032	.9192	.9332	.9452	.9554	.9641	.9713
2	.9772	.9821	.9861	.9893	.9918	.9938	.9953	.9965	.9974	.9981

12) What is the probability that a student scored between 500 and 720 on the math portion of the SAT?

13) What is the probability that a student scored more than 720 on the math portion of the SAT?

14) For the box-and-whisker plot below, identify a possible data set and calculate the fences for potential outliers.



A. $\{55, 70, 70, 80, 80, 90, 95, x\}$
Fences at $x = 55$ and $x = 95$

B. $\{55, 55, 70, 80, 90, 90, 95, x\}$
Fences at $x = 55$ and $x = 95$

C. $\{55, 70, 70, 80, 80, 90, 95, x\}$
Fences at $x = 40$ and $x = 120$

D. $\{55, 55, 70, 80, 90, 90, 95, x\}$
Fences at $x = 2.5$ and $x = 142.5$

15) If a value has a z-score of -0.5, then you know that the value is:

A. one standard deviation from the population mean
B. above the population mean
C. two standard deviations from the population mean
D. the same as the population mean
E. below the population mean

Algebra 2 **Name_____**
Unit 9 Practice Test

For #1 – 6, use the list below of ages of family members at a party.
3, 27, 9, 45, 8, 53, 14, 62, 30, 11, 70, 14, 41, 9

1) Find the median age of the family members at the party.

2) Find the mode age of the family members at the party.

3) Find the mean age of the family members at the party.

4) Find the range of ages.

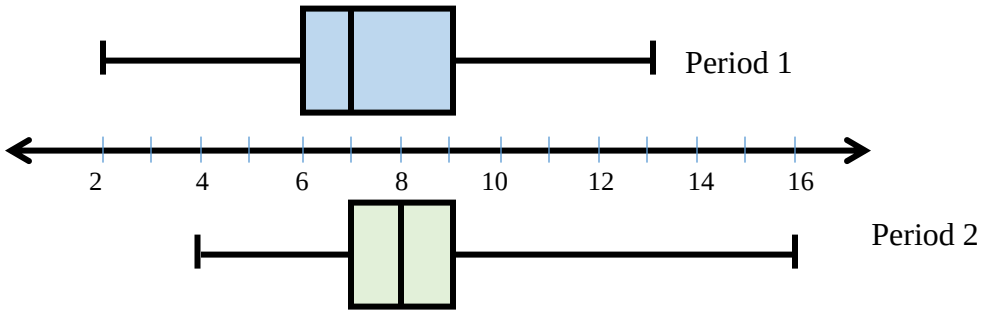
5) Find the standard deviation.

6) Use standard deviation to identify any outliers. Explain.

7) Angela took three tests so far in her math class, and her scores are 97, 78, and 89. What score must she get on her 4^{th} test in order to have an average of 90 on her tests?

8) Ryan took four quizzes so far in his science class, and his scores are 9, 7, 7.5, and 8. What must he score on his 5^{th} quiz in order to have an average of 8 on his quizzes?

For #9 – 15, use the box plots shown below, which display the number of movies seen in a theater in one year by students in two classes.



9) Find the IQR (Interquartile range) for period 1.

10) What is the median number of movies seen for students in period 2?

11) What approximate percentage of students from period 2 saw between 7 and 16 movies?

12) What approximate percentage of students from period 1 saw less than 6 movies?

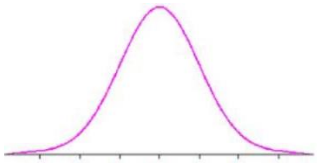
13) What is the range for period 2?

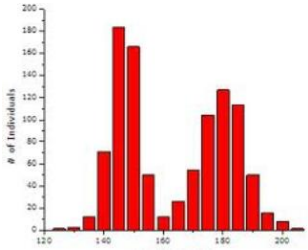
14) Use quartiles: Do any outliers exist for period 1? Explain.

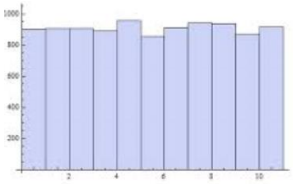
15) Which value cannot be found on a box plot?

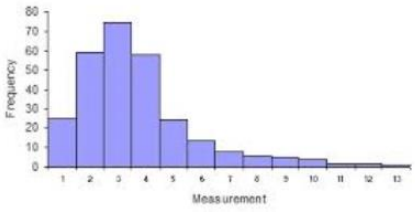
A) median B) range C) IQR D) mean

For #16 – 19, describe the shape of each distribution as normal, uniform, bimodal, skewed left, or skewed right.

16) 

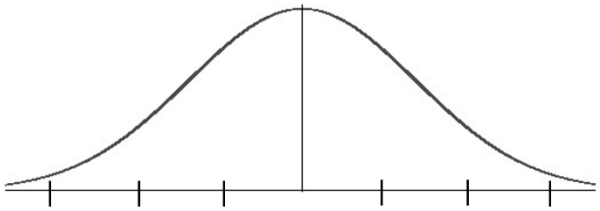
17) 

18) 

19) 

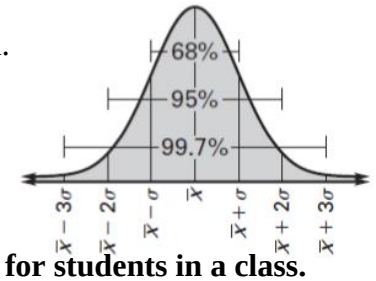
For #20 – 22, the weight of a baby born in Nevada is normally distributed with a mean of 7.5 pounds and a standard deviation of 0.5 pounds.

20) What percentage of babies born in Nevada weigh between 6.5 and 9 pounds?



21) What is the probability that a baby born in Nevada weighs less than 7 pounds?

22) A baby born in Carson City weighs 8.7 pounds. Is this weight an outlier? Explain.

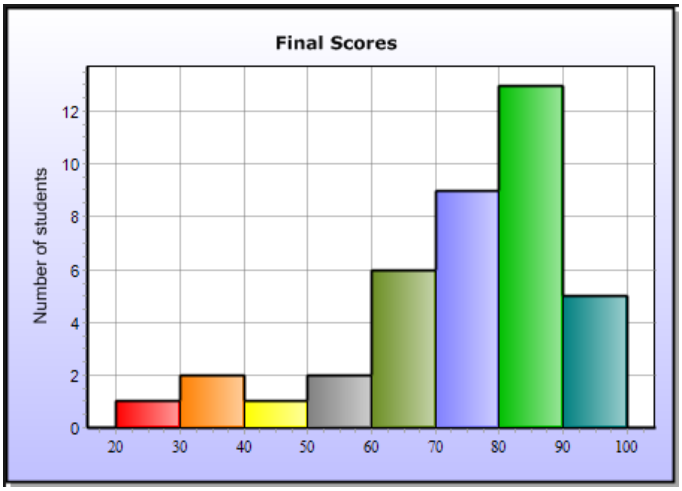


For #23 –26, use the histogram shown to the right, which displays the final grades for students in a class.

23) Approximately how many students are in the class?

24) Approximately how many students scored between 60 and 90 on the final?

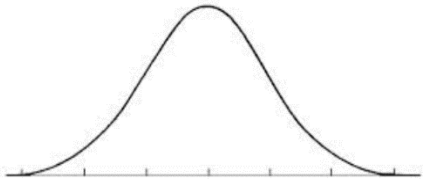
25) Approximately how many students scored less than 50 on the final?



26) In which category is the median height?

A) 50 – 60
B) 60 – 70
C) 70 – 80
D) 80 – 90

For #27 – 30: In 2012, scores on the math portion of the ACT are normally distributed with a mean of 21 and a standard deviation of 5.3.



27) Find the z-score for 29.

28) What is the probability that a student scored less than 29 on the math portion of the ACT?

z	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
−2	.0228	.0179	.0139	.0107	.0082	.0062	.0047	.0035	.0026	.0019
−1	.1587	.1357	.1151	.0968	.0808	.0668	.0548	.0446	.0359	.0287
−0	.5000	.4602	.4207	.3821	.3446	.3085	.2743	.2420	.2119	.1841
0	.5000	.5398	.5793	.6179	.6554	.6915	.7257	.7580	.7881	.8159
1	.8413	.8643	.8849	.9032	.9192	.9332	.9452	.9554	.9641	.9713
2	.9772	.9821	.9861	.9893	.9918	.9938	.9953	.9965	.9974	.9981

29) What is the probability that a student scored more than 29 on the math portion of the ACT?

30) What is the probability that a student scored between 19 and 29 on the math portion of the SAT?

Unit 9 Practice Test Answers

1) 20.5 2) 9 and 14 3) 28.3 4) 67 5) 21.4

6) None; all the values are within two standard deviations of the mean.

7) 96 8) 8.5

9) 3 10) 8 11) 75% 12) 25% 13) 12

14) No, all values are within 1.5(IQR) of the Q1 and Q3 values.

15) D 16) normal 17) bimodal 18) uniform 19) skewed right

20) 97.35% 21) 16% 22) Yes, it is more than 2 standard deviations above the mean.

23) 39 24) 28 25) 4 26) C 27) 1.5 28) .9332

29) .0668 30) .5886