Cumulative Test Worksheet – 2
WSK – AA – U2C7SP – 2

Name_____ Period_____

1. Given $y = \frac{1}{2}\sqrt{x-4} - 2$,

   a. what is the domain? 1a. _____

   b. what is the range? 1b. _____

   c. describe the horizontal shift. 1c. _____

   d. describe the vertical shift. 1d. _____

2. Given $y = 3\sqrt[5]{x+1} - 3$,

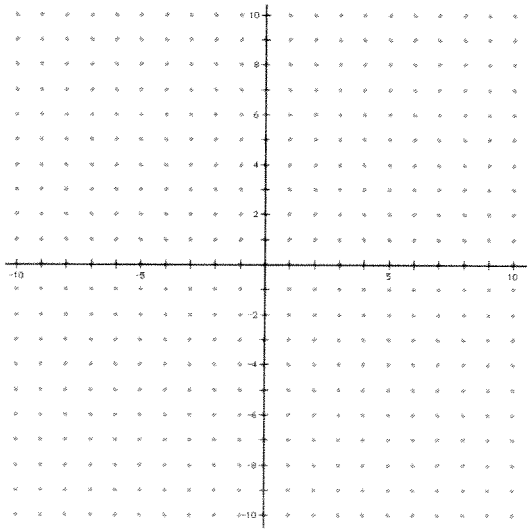
   a. what is the domain? 2a. _____

   b. what is the range? 2b. _____

   c. describe the horizontal shift. 2c. _____

   d. describe the vertical shift. 2d. _____

3. Graph the function $y = \sqrt[3]{x-1} - 1$ and state the domain and range of the function.



Domain: _____

Range: _____

For problems 4 – 7, solve the equation. Check for extraneous solutions.

4. $\sqrt{3x} = \sqrt{x+4}$ 4. _____

5. $(x-4)^{1/2} + 6 = x$ 5. _____

6. $(x-2)^{2/3} = 16$ 6. _____

7. $3(x+3)^{3/4} = 81$ 7. _____

For problems 8 – 11, simplify each radical expression. Assume all variables are positive. Do not use decimals.

8. $2\sqrt{125} - 3\sqrt{20}$ 8. _____

9. $\dfrac{\sqrt[5]{32x^{10}y^{25}}}{\sqrt[5]{x^4y^8}}$

9. _____

10. $\left(27^{-2}x^{-9}y^{15}\right)^{\frac{-1}{3}}$

10. _____

11. $\dfrac{5+2\sqrt{3}}{2-\sqrt{3}}$

11. _____

Cumulative Test Worksheet Key – 2
WSK – AA – U2C7SP – 2

Name_____ Period_____

1a. $[4, \infty)$

1b. $[-2, \infty)$

1c. Shift 4 units to the right.

1d. Shift 2 units down.

2a. $(-\infty, \infty)$

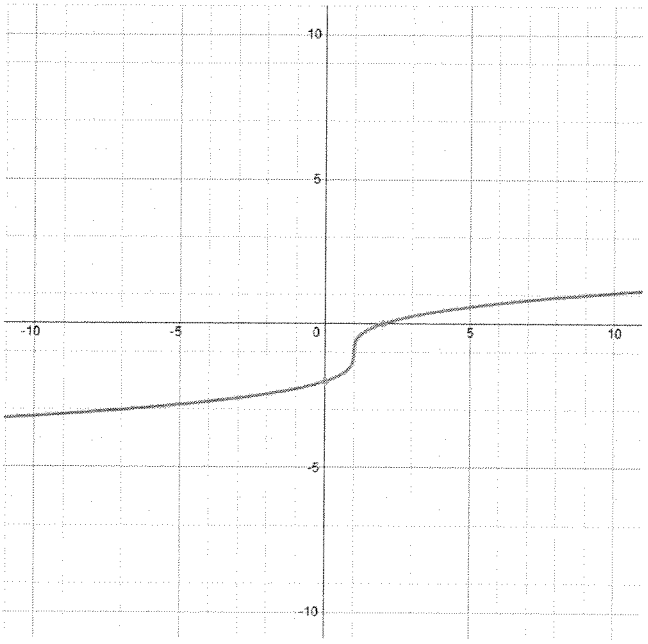
2b. $(-\infty, \infty)$

2c. Shift 1 unit to the left.

2d. Shift 3 units down.

3. Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$



4. $\sqrt{3x} = \sqrt{x+4}$

$\left(\sqrt{3x}\right)^2 = \left(\sqrt{x+4}\right)^2$

$3x = x + 4$

$2x = 4$

$x = 2$

Answer: $x = 2$

5. $(x-4)^{1/2} + 6 = x$

$(x-4)^{1/2} = x - 6$

$\left((x-4)^{1/2}\right)^2 = (x-6)^2$

$x - 4 = (x-6)(x-6)$

$x - 4 = x^2 - 12x + 36$

$0 = x^2 - 13x + 40$

$0 = (x-5)(x-8)$

$x - 5 = 0$ $\quad$ $x - 8 = 0$

$x = 5$ $\quad$ $x = 8$

$x = 5$ is extraneous.

Answer: $x = 8$

6. $(x-2)^{2/3} = 16$

$\left((x-2)^{2/3}\right)^{\frac{3}{2}} = \pm(16)^{\frac{3}{2}}$

$x - 2 = \pm 64$

$x = 2 \pm 64 = 66$ and -62

Answers: $x = 66$ and $x = -62$

7. $3(x+3)^{3/4} = 81$

$(x+3)^{3/4} = 27$

$\left((x+3)^{3/4}\right)^{\frac{4}{3}} = (27)^{\frac{4}{3}}$

$x + 3 = 81$

$x = 78$

Answer: $x = 78$

8. $2\sqrt{125}-3\sqrt{20}$

$2\sqrt{5^3}-3\sqrt{2^2\bullet 5}$

$2\sqrt{5^2}\bullet\sqrt{5}-3\sqrt{2^2}\bullet\sqrt{5}$

$2\bullet 5\sqrt{5}-3\bullet 2\sqrt{5}$

$10\sqrt{5}-6\sqrt{5}$

$4\sqrt{5}$

9. $\dfrac{\sqrt[5]{32x^{10}y^{25}}}{\sqrt[5]{x^4y^8}}$

$\sqrt[5]{32x^{10-4}y^{25-8}}$

$\sqrt[5]{2^5x^6y^{17}}$

$\sqrt[5]{2^5x^5y^{15}}\bullet\sqrt[5]{xy^2}$

$2xy^3\sqrt[5]{xy^2}$

10. $\left(27^{-2}x^{-9}y^{15}\right)^{\frac{-1}{3}}$

$27^{-2\bullet\frac{-1}{3}}x^{-9\bullet\frac{-1}{3}}y^{15\bullet\frac{-1}{3}}$

$27^{\frac{2}{3}}x^3y^{-5}$

$9x^3y^{-5}$

$\dfrac{9x^3}{y^5}$

11. $\dfrac{5+2\sqrt{3}}{2-\sqrt{3}}$

$\dfrac{5+2\sqrt{3}}{2-\sqrt{3}}\bullet\dfrac{2+\sqrt{3}}{2+\sqrt{3}}$

$\dfrac{\left(5+2\sqrt{3}\right)\left(2+\sqrt{3}\right)}{\left(2-\sqrt{3}\right)\left(2+\sqrt{3}\right)}$

$\dfrac{10+5\sqrt{3}+4\sqrt{3}+2\sqrt{9}}{4+2\sqrt{3}-2\sqrt{3}-\sqrt{9}}$

$\dfrac{10+5\sqrt{3}+4\sqrt{3}+2\bullet 3}{4+2\sqrt{3}-2\sqrt{3}-3}$

$\dfrac{10+5\sqrt{3}+4\sqrt{3}+6}{1}$

$10+5\sqrt{3}+4\sqrt{3}+6$

$16+9\sqrt{3}$

Cumulative Test Worksheet
WS – AA – U2C7SP

Name_____ Period_____

For problems 1 – 5, refer to Geist High School, which consists of 525 freshmen, 490 sophomores, 475 juniors, and 510 seniors. For the following problems, find each theoretical probability.

1. P(not junior) 1. _____

2. P(senior) 2. _____

3. P(freshman or sophomore) 3. _____

4. P(junior, then senior)
<u>with replacement</u> 4. _____

5. P(sophomore, then junior)
<u>without replacement</u> 5. _____

For problems 6 – 7, you roll a die. Find each theoretical probability.

6. P(odd number or multiple of 3) 6. _____

7. P(even number or 1) 7. _____

8. A crate has 12 bottles of pop. Three are Pepsi, two are Coca-Cola, four are Mountain Dew, and three are Dr. Pepper. What is the probability of picking two Dr. Pepper bottles from the crate, assuming you do not return the first bottle? 8. _____

9. Which of the following pairs are **mutually exclusive**? Select A or B. Explain. 9. _____

A. Being a mother and a grandmother

B. Being a daughter and a son

10. Which of the following pairs are **independent events**? Select A or B. Explain. 10. _____

A. Picking two separate items out of a bag

B. Picking an item out of a bag, replacing it, and then picking another item out of the bag

11. 80% of the American population votes, 90% of the American population reads, and 85% of the American population votes and reads. What percentage of the American population votes or reads (P(votes or reads))? 11. _____

For problems 12 – 13, determine how many passwords are possible. ***Show work or receive no credit.***

12. Two letters and six digits (0 – 9). Letters and digits cannot be repeated. 12. _____

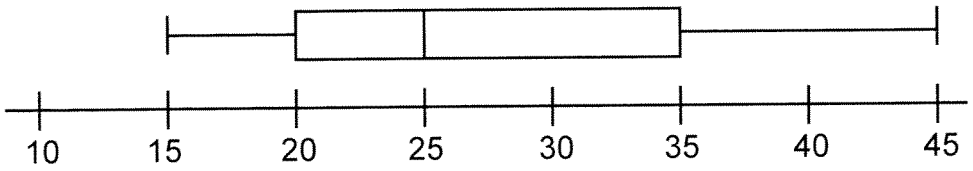
13. Four letters and four digits (0 – 9). The first letter must be D, and the second letter must be H. Letters and digits can be repeated. 13. _____

For questions 14 – 15, ***show work or receive no credit***.

14. Mr. Geist wants to choose groups of 2 or 3 students out of a class of 12 students. How many groups of students can he pick? 14. _____

15. How many ways can Ms. Heimes pick a president, vice-president, and secretary out of 12 students? 15. _____

For questions 16 – 20, refer to the following box-and-whisker plot.



16. Find the interquartile range of the data. 16. _____

17. What does the interquartile range tell you about the data? 17. _____

_____

_____

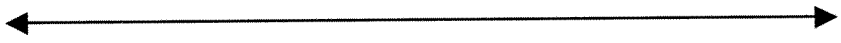
18. Find the range of the data. 18. _____

19. Find the median of the data. 19. _____

20. What percent of data is between 25 and 35? 20. _____

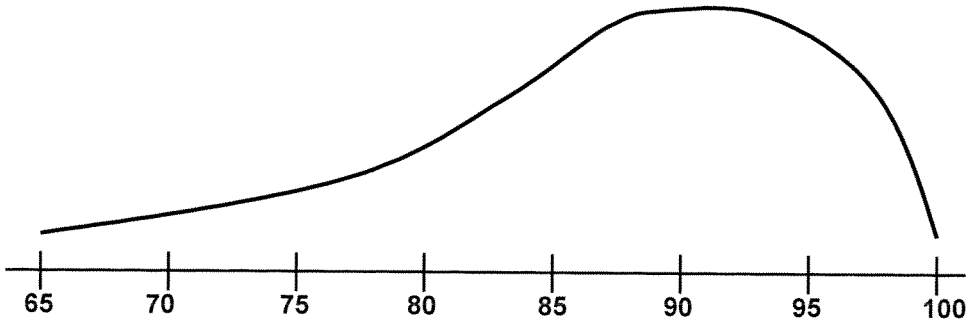
21. A set of data has a mean of 59% and a standard deviation of 5%.

A. Draw the normal curve for this distribution. Label the *x*-axis with the values that are one, two, and three standard deviations from the mean.



B. What percentage of the data has the value of 64% or above? B. _____

22. Below is a distribution of test scores from Mr. Geist's differentiated chemistry class. Are the scores positively skewed, negatively skewed, or normally distributed? Explain. Also explain how the mean is affected by this distribution.



Explanation: _____

_____

_____

23. The salaries of teachers at a small rural school are shown below.

A. What is the mean, median, and mode of the salaries?

Salaries of teachers at the school:

$28,000	$34,000	$36,000
$28,000	$34,000	$38,000
$28,000	$34,000	$70,000
$34,000		

A. Mean: _____

Median: _____

Standard deviation: _____

B. The local school board and teacher's union are preparing to meet about pay raises. If you were a teacher making the lowest salary, which of the following would you ***NOT*** use to justify a pay raise: the mean or the median? Why?

Explanation: _____

_____

_____

C. How would it impact the mean and the standard deviation if you removed the $70,000 salary? Explain.

Mean: _____

_____

Standard deviation: _____

_____

Cumulative Test Worksheet Key
WSK – AA – U2C7SP

Name_____ Period_____

1. $\frac{525}{2000}+\frac{490}{2000}+\frac{510}{2000}=\frac{1525}{2000}=\frac{61}{80}$

2. $\frac{510}{2000}=\frac{51}{200}$

3. $\frac{525}{2000}+\frac{490}{2000}=\frac{1015}{2000}=\frac{203}{400}$

4. $\frac{475}{2000}\bullet\frac{510}{2000}=\frac{242250}{4000000}\approx 0.061$

5. $\frac{490}{2000}\bullet\frac{475}{1999}=\frac{232750}{3998000}\approx 0.058$

6. $\frac{3}{6}+\frac{2}{6}-\frac{1}{6}=\frac{4}{6}=\frac{2}{3}$

7. $\frac{3}{6}+\frac{1}{6}=\frac{4}{6}=\frac{2}{3}$

8. $\frac{3}{12}\bullet\frac{2}{11}=\frac{6}{132}=\frac{1}{22}$

9. B. Being a daughter and a son

   One cannot be a daughter and a son at the same time.

10. B. Picking an item out of a bag, replacing it, and then picking another item out of the bag

    One picking of an item does not affect the other picking of an item.

11. 80% + 90% – 85% = 85%

12. $26 \bullet 25 \bullet 10 \bullet 9 \bullet 8 \bullet 7 \bullet 6 \bullet 5$
    = 98280000 passwords

13. $1 \bullet 1 \bullet 26 \bullet 26 \bullet 10 \bullet 10 \bullet 10 \bullet 10$
    = 6760000 passwords

14. ${}_{12}C_2 + {}_{12}C_3 = 66 + 220$
    = 286 groups

15. ${}_{12}P_3$ = 1320 ways

16. 35 – 20 = 15

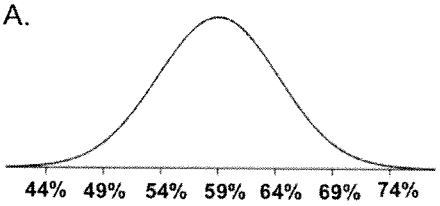
17. 50% of the data is between the values of 20 and 35.

18. 45 – 15 = 30

19. 25

20. 25% (one quartile)

21. A.



    B. 13.5% + 2.5% = 16%

22. Negatively skewed (points in the negative direction); the overall performance of the class was very good. The mean would be higher because of the distribution.

23. A. Mean: $36,400
Median: $34,000
Standard deviation: $11,689

B. Mean; it is higher in value, resulting in less likelihood of a raise if used as a justification

C. The mean would be lower because a higher outlier is no longer present.

The standard deviation would be lower because values would be closer together (not spread out as much).