

Cumulative Test Worksheet – Stats

Name KEY 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) $\frac{2000 - 475}{2000}$ 1. $\approx 76.3\%$

$$\frac{1525}{2000} = .7625$$

2. P(senior) 2. $\approx 25.5\%$

$$\frac{510}{2000} = .255$$

3. P(freshman ^{Add} or sophomore) 3. $\approx 50.8\%$

$$\frac{525}{2000} + \frac{490}{2000} = \frac{1015}{2000} = .5075$$

4. P(junior, ^{Mult.} then senior) with replacement 4. $\approx 6.1\%$

$$\frac{475}{2000} \cdot \frac{510}{2000} = \frac{242250}{4,000,000} = .06056$$

or

$$(.2375)(.255) = .06056$$

5. P(sophomore, ^{Mult.} then junior) without replacement 5. $\approx 5.8\%$

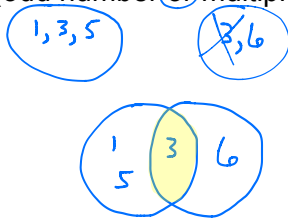
$$\frac{490}{2000} \cdot \frac{475}{1999} = \frac{232750}{3,998,000} = .05822$$

or

$$(.245)(.2376) = .0582$$

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

6. P(odd number ^{AND} or multiple of 3)



$$\frac{3}{6} + \frac{2}{6} - \frac{1}{6}$$

$$\frac{5}{6} - \frac{1}{6}$$

$$\frac{4}{6} \text{ or } \frac{2}{3} \approx .\bar{6}$$

6. ≈ 66.7 %

7. P(even number or 1)



$$\frac{3}{6} + \frac{1}{6} = \frac{4}{6} \text{ or } \frac{2}{3} \approx .\bar{6}$$

7. ≈ 66.7 %

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?

$$\frac{3}{12} \cdot \frac{2}{11} \Rightarrow \frac{1}{4} \cdot \frac{2}{11} \Rightarrow \frac{1}{22} \approx .045$$

8. ≈ 4.5 %

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

- A. Being a mother and a grandmother
- B. Being a daughter and a son

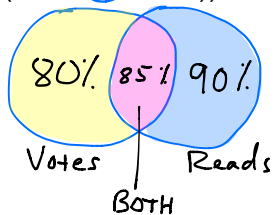
9. B. C cannot be both.

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

- 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

10. A. One event does not depend on the previous event.

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))?



$$80 + 90 - 85$$

$$170 - 85$$

$$85$$

11. 85 %

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. 98,280,000

$$\underline{26} \cdot \underline{25} \cdot \underline{10} \cdot \underline{9} \cdot \underline{8} \cdot \underline{7} \cdot \underline{6} \cdot \underline{5} =$$

OR

$${}_{26}P_2 \times {}_{10}P_6$$

order matters

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. 6,760,000

$$\frac{D}{1} \frac{H}{1} \underline{\quad} \underline{\quad} \cdot \underline{\quad} \underline{\quad} \underline{\quad} \underline{\quad}$$

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. 286

No order

$${}_{12}C_2 + {}_{12}C_3$$

$$66 + 220 = 286$$

15. How many ways can Mr. Adler pick a president, vice-president, and secretary out of 12 students?

15. 1,320

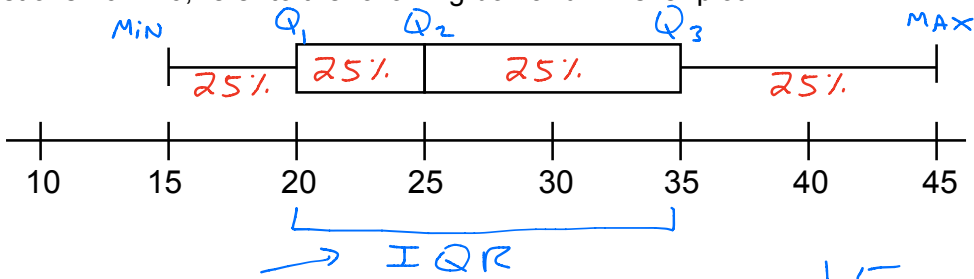
order

$$\frac{12}{P} \cdot \frac{11}{VP} \cdot \frac{10}{Sec.} = 1320$$

OR

$${}_{12}P_3 = 1320$$

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



16. Find the interquartile range of the data.

16. 15

$35 - 20$

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

17. 50% of the class is

between 20 and 35.

18. Find the range of the data.

18. 30

$45 - 15$

19. Find the median of the data.

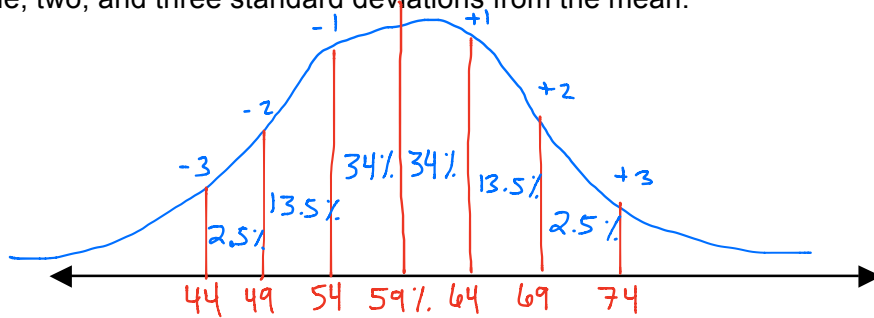
19. 25

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

20. 25%

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.

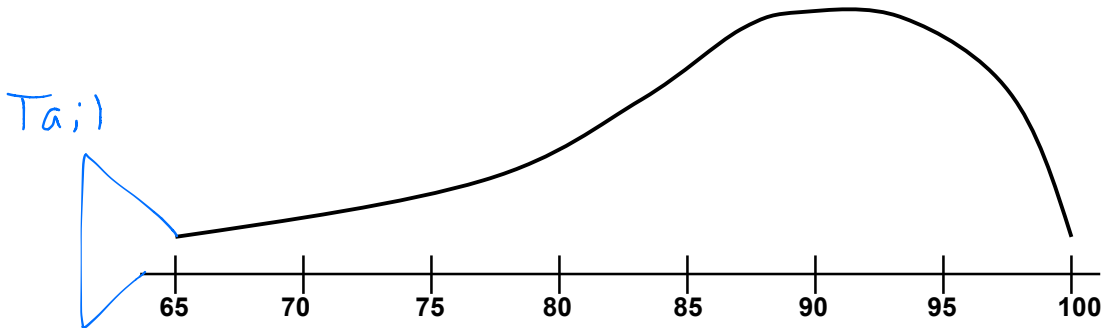


B. What percentage of the data has the value of 64% or above?

B. 16%

$13.5\% + 2.5\%$

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: Negatively skewed - or skewed left
The mean follows the outlier... the tail.
so the mean is smaller or left.

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: \$ 36,400
 Median: \$ 34,000
 Standard deviation: \$ 11,689

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: I would not mention the median because it is
lower than the mean.
Other justifications are also acceptable.

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

Mean: Lowers to \$ 32,667. The outlier of \$ 70,000 is removed
and it factors into the average salary.

Standard deviation: Lowers to \$ 3,528. There is now less spread
and less variance w/out the \$ 70,000 outlier