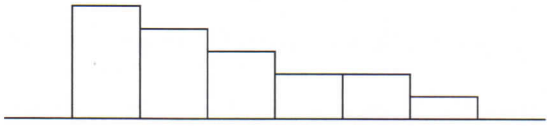
AP STATISTICS
(Warm-Up Exercises)

1. Describe the distribution of ages in a city:



2. Graph a box plot on your calculator for the following test scores:
{90, 80, 96, 54, 80, 95, 100, 75, 87, 62, 65, 85, 92, 87, 74, 89}

3. Draw a stem and leaf plot for the data in problem 2.

4. If the test scores from problem 3 come from a normal distribution with $\mu = 80$, $\sigma = 5$ then

   a. calculate the z-score for a score of 90

   b. use your calculator to find the percent of scores below 92

   c. use your calculator to find the percent of scores greater than 87

   d. what score would be at the 90th percentile?

5. Jeff made a 90 on his Algebra I test. The class average is 83 and the standard deviation is 5. Mary made a 95 on her test in another class. Her class average is 85 and the standard deviation is 8. Who did better relative to his/her peers?

6. Calculate r^2, r and the equation for the LSRL for:
Quiz average X = {90, 82, 97, 90, 85, 73, 98, 45, 79, 86}
Quiz Average Y = {87, 80, 95, 70, 88, 72, 95, 52, 80, 82}

7. Is there a linear relationship in the data from problem 6?

8. Given $r = .9867$, $r^2 = .9736$ and $\hat{y} = .035 + .72x$, what percent of the change in y is ~~caused~~ explained by x?

9. If a residual plot reveals that a linear regression is not appropriate for 2 variables, what is the next step in finding the prediction equation?

10. Using the data in the table below, find the distribution of grades for those enrolled in the program.

Grade	Enrolled In Program?	
	Yes	No
A or B	12	5
C or D	9	8
F	4	12

11. Design an experiment for testing a new drug on a sample of 60 subjects.

12. Design a simulation that would replicate the probabilities for selecting a person based on ethnicity in the US if 60% are white, 20% black and 20% other.

13. What is probability?

14. Let random variable X = number of composite numbers (4 or 6) when rolling 3 dice.

The probability distribution is below. Calculate the mean.

X	0	1	2	3
P(X)	.037	.444	.222	.296

.2963 .4444 .2222 .037

15. Using the probability model above,

a. calculate $P(X \leq 1)$

b. determine the complement for X = 3

16. Given a bag of M&Ms {3Br, 2R, 2Y, 1O, 1Bl, 1Gr), let X = number of brown M&Ms chosen. If you choose 3 M&Ms at random, with replacement, find P(X = 1).

17. If a population is skewed right, describe a sampling distribution of the population with a sample size of 50.

of $\bar{x}$

18. What is the standard deviation of a sampling distribution if $\sigma = 4.2$ and n = 50?

19. In a certain skewed population of 50,000 people, P(blue eyes) = .42. A sample size of 40 is taken. Is the sampling distribution normal?

approximately

20. List the steps for:

a. Calculating a confidence interval

b. Performing a hypothesis test

21. At a bakery, loaves of bread are supposed to weigh 1 pound. You believe the loaves are, on average, heavier than 1 pound and want to test your hypothesis. You weigh 20 loaves and obtain a mean weight of 1.05 pounds with s = .13.

a. Identify the population

b. Identify the parameter of interest

c. Test your hypothesis

22. Given the distribution of SAT scores is normal with $\sigma = 40$, a random sample of scores from a school is taken: 1070, 1280, 1000, 1210, 1100, 980, 1350, 900, 1050, 1280, 1120, 1090, 1240, 1350, 1190, 1020.

    a. Calculate a 90% confidence interval for the average SAT score of all students in the school.

    b. Is there statistical evidence to claim the average SAT score at this school differs from 1150?

23. A teacher believes the average IQ of ~~her~~ his students is lower than 100. He finds the IQs of 6 students selected randomly: 90, 92, 94, 102, 100 and 95. Is there statistical evidence to support his hypothesis?

24. What is the critical value t* for a 95% confidence interval from a sample size of 9?

25. Below are the results of SAT math scores for 13-year olds:

Group	Size	$\bar{x}$	s
Males	19,883	416	87
Females	19,937	386	74

Give a 99% confidence interval for the difference between the mean score for males and the mean score for females and interpret the interval.

26. Last year, Tyler made 40% of his free throws. In the first 8 games of this year's season, he made 25 out of 40 free throws.

    a. Verify the conditions for performing a significance test.

    b. Determine if Tyler's free throw shooting has improved over last year and state your conclusion at the $\alpha = .01$ level

27. State the conditions for a chi-square test.

28. Below are the results of a local election:

Gender	**Voted**	**Did Not Vote**
Male	2,792	1,486
Female	3,591	2,131

Determine if there was an association between gender and voter participation.