

Algebra 1

2015 Winter Break Packet – Student



Department of Mathematics
Office of Academics and Transformation

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DESCRIPTIVE STATISTICS

Task 1

1. Complete the table for each company.

Tiny Tech Corporate Structure

Job Title	Number of Employees	Salary (In Thousands)	Total (In Thousands)
CEO	1	75	
CFO	2	60	
Office Manager	2	60	
Tech Support Tech	4	45	
Office Staff	8	30	
Production Staff	12	25	
Cleaners	3	15	
Total			

Adventure Web Corporate Structure

Job Title	Number of Employees	Salary (In Thousands)	Total (In Thousands)
CEO	1	85	
CFO	1	70	
Office Manager	2	65	
Tech Support Tech	2	50	
Office Staff	4	40	
Production Staff	8	27	
Cleaners	2	17	
Total			

2. Calculate the mode, median, and mean for the *Tiny Tech Company's* salary (in thousands).

Mode -

Median -

Mean -

3. Calculate the mode, median, and mean for the *Adventure Web Company's* salary (in thousands).

Mode -

Median -

Mean -

4. For Tiny Tech, which measure of central tendency best represents the salary structure of the company? Use words and/or numbers to justify your answer.

5. For Adventure Web, which measure of central tendency best represents the salary structure of the company? Use words and/or numbers to justify your answer.

Task 2

Using the following link, find the data for the Total Gross Money for months January 2012 and January 2013. Compare the center (mean and median) and spread (IQR and standard deviation) of the total grosses of the top 10 movies released in those months.

Write a brief report summarizing what you found and what might account for the differences you observe.

<http://boxofficemojo.com/yearly/chart/past365.htm> - Past 365 days, Top 100 movies, date released and total gross

Task 3

The table below displays the percentage of the population living in poverty by state for 2012-2013

State	Region	2012-2013	State	Region	2012-2013
Alabama	South	16.4	Montana	West	14.0
Alaska	West	10.5	Nebraska	Midwest	11.6
Arizona	West	19.6	Nevada	West	16.6
Arkansas	South	18.6	New	East	8.6
California	West	15.4	New Jersey	East	10.2
Colorado	West	11.2	New Mexico	West	21.0
Connecticut	East	10.8	New York	East	15.9
Delaware	East	13.7	North Carolina	South	17.9
District of Columbia	East	19.9	North Dakota	Midwest	10.6
Florida	South	15.1	Ohio	Midwest	14.5
Georgia	South	17.2	Oklahoma	South	16.0
Hawaii	West	12.5	Oregon	West	14.3
Idaho	West	13.7	Pennsylvania	East	13.1
Illinois	Midwest	12.9	Rhode Island	East	13.6
Indiana	Midwest	13.4	South Carolina	South	16.3
Iowa	Midwest	10.5	South Dakota	Midwest	11.5
Kansas	Midwest	13.6	Tennessee	South	18.4
Kentucky	South	18.9	Texas	South	16.9
Louisiana	South	20.2	Utah	West	9.6
Maine	East	12.5	Vermont	East	10.0
Maryland	East	10.1	Virginia	South	10.5
Massachusetts	East	11.6	Washington	West	11.8
Michigan	Midwest	14.1	West Virginia	East	17.0
Minnesota	Midwest	11.0	Wisconsin	Midwest	11.2
Mississippi	South	22.2	Wyoming	West	10.7
Missouri	Midwest	14.5			

Source – US Census Bureau www.census.gov/hhes/www/poverty/data/incpovhlth/2013/tables.html

1. Complete the two-way frequency table below.

% of Population Living Poverty by Region – 2011-2012

Region	7-11	12-16	17-22	Total
South				
East				
West				
Midwest				
TOTAL				

2. Complete the Relative Frequency Table

% of Population Living Poverty by Region – 2011-2012

Region	7-11	12-16	17-22	Total
South				
East				
West				
Midwest				
TOTAL				

- What do you notice about the distribution of total people living in poverty for each of the four regions overall?
- Are there any differences in the levels of poverty for each of the regions individually, and in comparison to one another?
- Can you reach any conclusions about the regions of the country based on this summary of the data?

FUNCTIONS

1. Consider the function described in the table below.

Input	-7	-5	-3	2	5
Output	-28	-20	-12	8	20

- a. Describe what this function "machine" is doing.
- b. Express this function using function notation. $f(x) =$ _____
2. Jacob has started a new job working for his neighbor Paul. Paul said that his weekly pay would be a function of the hours he worked. What does this mean?
3. Complete a table that might describe Jacobs's weekly pay as a function of the hours he worked. Be sure to describe the input and output variables.

Hours Worked						
Weekly Pay in Dollars						

- b. What things did you have to decide before you completed the table?
4. Rocco needs to lose weight to wrestle in the 104 pound weight class. He currently weighs 135 pounds and estimates that he can lose an additional 2.5 pounds per week. Express this function using a table and function notation.

Week #						
Weight in lbs.						

- a. When will he make weight? Use mathematics to justify your answer.

5. Describe the function $f(t) = 20t + 50$ using a table and a story that this function is describing. Describe what is represented by the domain and what is represented by the range.

6. Marcus is launching t-shirts into a crowd of people from the top of a 30ft tower. The height of the t-shirts above the tower as a function of time can be described by the function below. $h(t) = -16t^2 + 50t + 30$. Use the function to determine the height of the t-shirt at each given time in seconds. Write a complete sentence to interpret your solution in terms of the problem situation.

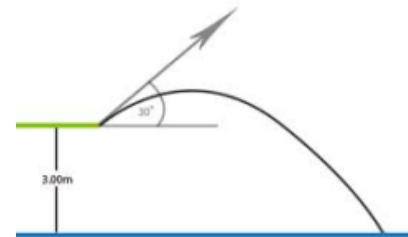
a. $h(3) =$

b. $h(0) =$

c. $h(5) =$

- d. What is special about the value of $h(0)$?

- e. Look at the height for $h(5)$. Since the tower is 30 feet tall, what does this tell you about what has happened to the t-shirt?



CREATING EQUATIONS

1. Sheila wants to rent carpet cleaning supplies to clean her house. The cost of renting the machine is \$40 per day and the cost of purchasing the chemicals is \$65 per room.

Part A. Write an equation to model the cost of renting equipment for the day.

Part B. Explain what each variable represents.

Part C. Graph your equation.

2. Veronica and Rich went shopping at Staples. They found that the store sells pens at \$2 and notebooks at \$5.

n = number of notebooks sold.

p = number of pens sold.

Here are two true equations:

$$\begin{aligned}4n &= p \\5n + 2p &= 39\end{aligned}$$

Here is what Rich and Veronica think the equations mean:

Rich: I think the first equation means that the store sells four times as many notebooks as pens

Veronica: I think the second equation means that the store sold 5 notebooks and 2 pens.

Are Rich and Veronica correct? Justify your answer.

3. Ben is in charge of setting up the hall for the school musical. Ben contacted two different rental places for seats.

Big Chairs - 50 chairs for \$200 dollars includes set up and delivery

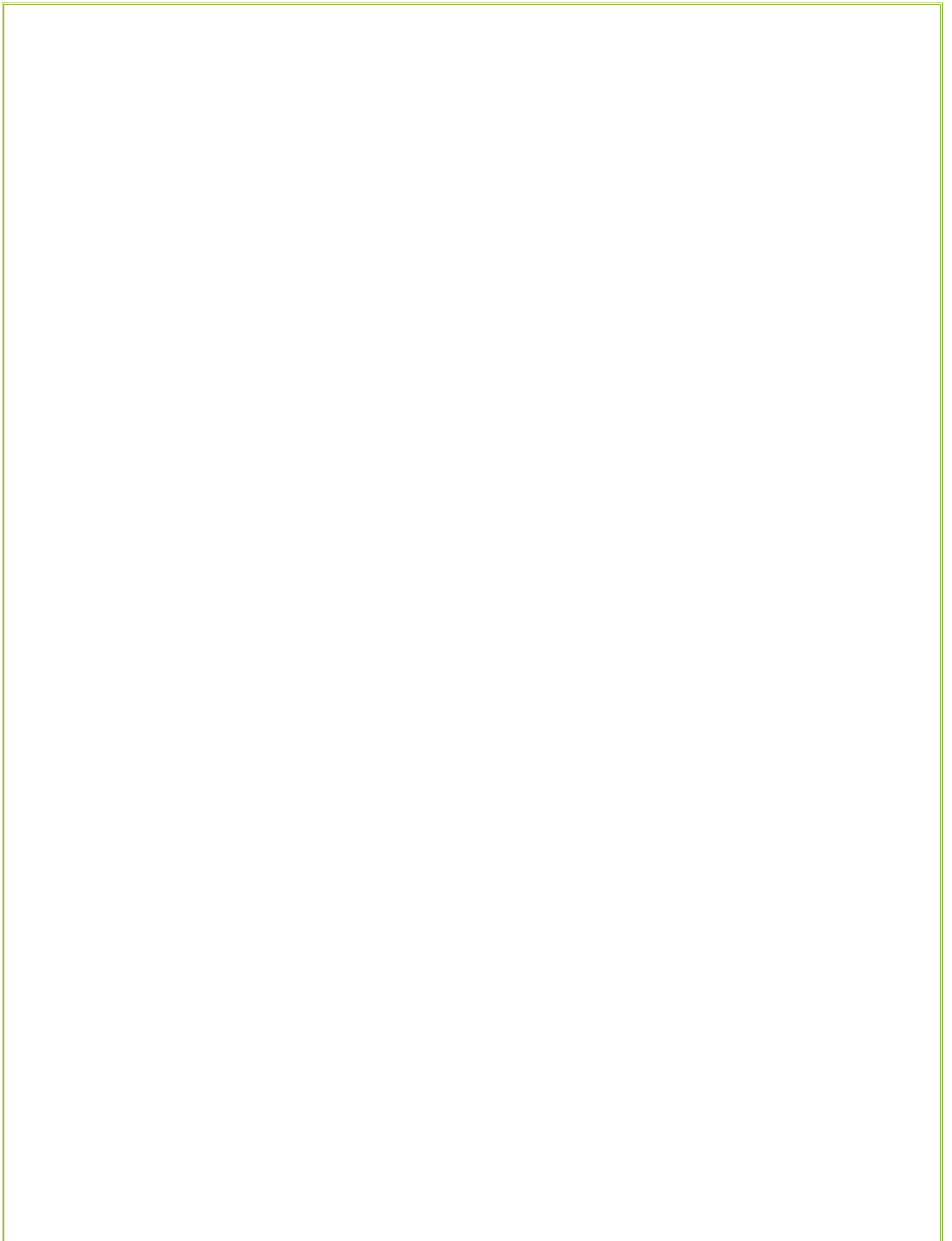
Super Seats - 50 chairs for \$100 dollars and a \$400 set up and delivery fee

Part A. Let C represent the total cost of chair rentals and s to represent the amount of chairs rented. Develop a function that states the total cost for each company.

Part B. Ben will need to rent 300 seats. Determine which company offers the best price.

Part C. Graph the cost of chair rentals for each company.

Part D. Use your graph to determine if the cost of chair rentals will ever be the same at both companies. Explain your reasoning.



Non-Discrimination Policy

The School Board of Miami-Dade County, Florida adheres to a policy of nondiscrimination in employment and educational programs/activities and strives affirmatively to provide equal opportunity for all as required by:

Title VI of the Civil Rights Act of 1964 - prohibits discrimination on the basis of race, color, religion, or national origin.

Title VII of the Civil Rights Act of 1964 as amended - prohibits discrimination in employment on the basis of race, color, religion, gender, or national origin.

Title IX of the Education Amendments of 1972 - prohibits discrimination on the basis of gender.

Age Discrimination in Employment Act of 1967 (ADEA) as amended - prohibits discrimination on the basis of age with respect to individuals who are at least 40.

The Equal Pay Act of 1963 as amended - prohibits gender discrimination in payment of wages to women and men performing substantially equal work in the same establishment.

Section 504 of the Rehabilitation Act of 1973 - prohibits discrimination against the disabled.

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The Family and Medical Leave Act of 1993 (FMLA) - requires covered employers to provide up to 12 weeks of unpaid, job-protected leave to "eligible" employees for certain family and medical reasons.

The Pregnancy Discrimination Act of 1978 - prohibits discrimination in employment on the basis of pregnancy, childbirth, or related medical conditions.

Florida Educational Equity Act (FEEA) - prohibits discrimination on the basis of race, gender, national origin, marital status, or handicap against a student or employee.

Florida Civil Rights Act of 1992 - secures for all individuals within the state freedom from discrimination because of race, color, religion, sex, national origin, age, handicap, or marital status.

Title II of the Genetic Information Nondiscrimination Act of 2008 (GINA) - Prohibits discrimination against employees or applicants because of genetic information.
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In Addition:

School Board Policies 1362, 3362, 4362, and 5517 - Prohibit harassment and/or discrimination against students, employees, or applicants on the basis of sex, race, color, ethnic or national origin, religion, marital status, disability, genetic information, age, political beliefs, sexual orientation, gender, gender identification, social and family background, linguistic preference, pregnancy, and any other legally prohibited basis. Retaliation for engaging in a protected activity is also prohibited.

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