

Math 123 Quiz 8 - Absolute and Relative Change, Relative Percentages, Linear Models, Scatterplots and Trend Lines, Exponential Growth and Decay Models

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Show work to receive full credit.

1. (9 pts) The table below shows the percent of people of all ages in poverty in the U.S. and Indiana.

Percent of All Ages in Poverty		
State / County Name	2001	2011
United States	11.7	15.9
Indiana	9	15.8
Dubois County	5	8.3
Elkhart County	9	18.3
Knox County	13.2	19.7
Tippecanoe County	10.5	21.4
Wayne County	11	21.1

- a) Find the Absolute Change in the percent of people living in poverty in Indiana from 2001 to 2011.

- b) Find the Relative Change in the Percent of those living in Poverty for the state of Indiana from 2001 to 2011.

- c) Use the Relative Change you found in part b to write a sentence explaining the change.

1. (2 pts) You are charged \$13.21 total for a meal. If the sales tax is 7%, how much was the menu price of the meal?

2. (2 pts) An item that normally sells for \$220 is marked down by 40%. What is the sale price?

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3. (4 pts) Gas prices are down 8% this month

a) If the price at Family Express was \$3.25 last month, what is the price now?

b) If the price at Speedway is \$3.05 this month, what was the price last month?

1. (8 pts) According to the Ivy Tech website, students will pay a \$60 technology fee and \$121.50 per credit hour for Spring 2015.

a. Set up a linear model to calculate a student's bill based on this information.

b. The independent variable in my model is _____ and it represents _____

c. The dependent variable in my model is _____ and it represents _____

d. Use your model to determine how many credit hours a student is taking if his bill is \$1639.50.

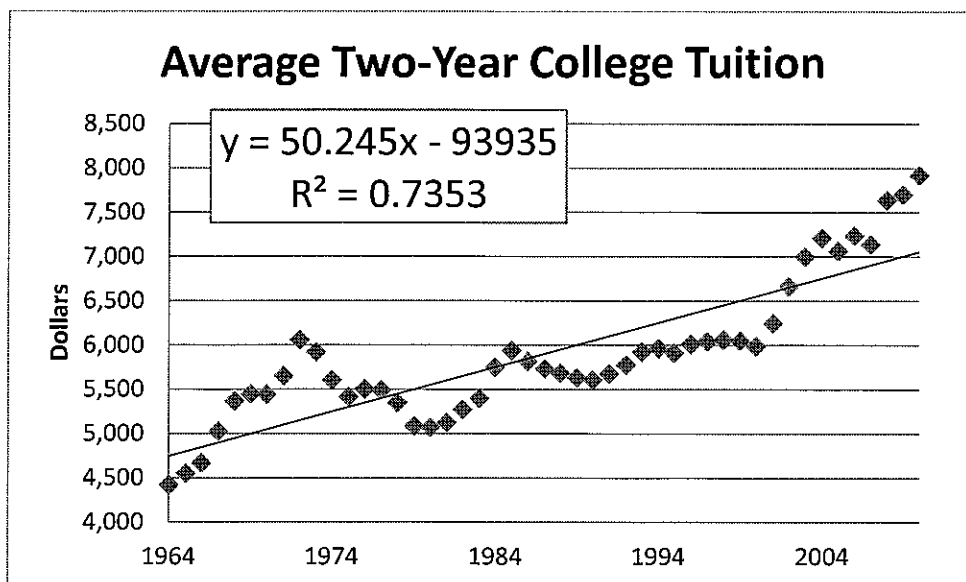
2. (6 pts) A can of soda costs \$0.10 in 1972 and \$1.25 in 2012.

a. Construct a linear model that can be used to predict the cost of a soda in a given year.

b. Use your linear model to predict the cost of a soda in 2014.

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3. (12 pts) A scatter plot was made using data on tuition at public two-year colleges from 1964-2011 and a linear trend line was added. The equation and R^2 for the trend line are in the textbox on the graphic. Data from: <http://nces.ed.gov/fastfacts/display.asp?id=76>



4. What is the independent variable in this model, and what does it represent?
5. What is the dependent variable in this model, and what does it represent?
6. Use the **trend line** equation to predict tuition costs for 2014.
7. Find the r value for this regression line. What does it tell you about the accuracy of model?
8. Interpret the meaning of the **slope** of the **trend line**.
9. Should we use the linear model to predict tuition for 2025? Why or Why not?

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1. (6 pts) To celebrate Ivy Tech's anniversary, a landscaper puts 50 water lilies in a pond the week before classes start. Unfortunately, every lily splits and produces a second lily once a week.

- a. Fill out this table for the number of lilies for the first few weeks:

Week 0	50
Week 1	
Week 2	
Week 3	
Week 4	

- b. Write an equation to find the number of lilies in a given week.

- c. Use your equation to find the number of lilies that will be in the pond by week 16?

2. (6 pts) The landscaper pours 200 gallons of herbicide in the pond.

- a. If the herbicide degrades 10% each week, how much will be in the pond after 1 week?

- b. Write an equation to find the amount of herbicide in any given week.

- c. The landscaper will put another dose in the pond when the herbicide level reaches 50 gallons. In how many weeks will he need to add more herbicide?