

NAME: _____

UNIT 1 • RELATIONSHIPS BETWEEN QUANTITIES

Lesson 3: Creating and Graphing Equations in Two Variables

Problem-Based Task 1.3.2: Investing Money

You want to invest some money in a savings account. One bank offers an account that compounds the money annually at a rate of 3%. You have \$2,000 to invest. As you are about to sign the papers, your friend texts you that a different bank offers a rate of 3.2% and this bank will compound the interest monthly. You decide to check out the second bank, but on your way there you spend \$100. You end up choosing the second bank with the higher interest rate, but you want to know how spending \$100 along the way affected your investment.

Create a graph showing how much interest you would have earned on \$2,000 at the first bank, then create another graph showing how much interest you will earn on the money you invested in the second bank. Use the graphs to help you determine about how long it will take to earn back the \$100 you spent. How long will it take before the two graphs are equal? How would your investment have changed if you hadn't spent the \$100? What can you conclude about investing?

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Coaching

- a. What is the equation for the investment at the first bank?
- b. What is the equation for the investment at the second bank? Keep in mind that you spent \$100 of the money you initially planned to invest.
- c. Graph the equations on the same set of axes, and be sure to label each equation.
- d. Looking at the graph of the investment you actually made, how many years does it take to earn back the \$100 you spent?
- e. How many years does it take before the investment you made is equal to the investment you almost made?
- f. What would be the equation of the investment at the second bank if you had not spent the \$100?
- g. Graph the equation from part f on the same set of axes as the equation from part b.
- h. Look at various points along the graph and use the equations. What is the difference in investments after 10 years? 20 years?
- i. Compare the investments of all 3 graphs and make observations. What conclusions can you draw about the amount you invest initially or the principal amount? What can you conclude about the number of times the interest is compounded in a year? What effect does this have on the investment?