

NAME: _____

UNIT 3 • LINEAR AND EXPONENTIAL FUNCTIONS

Lesson 1: Graphs As Solution Sets and Function Notation

Problem-Based Task 3.1.2: Senior Trip

Jacob and Antonio are incoming high school freshmen, with big plans for a trip to Europe after graduation in 4 years. They each need to save \$3,500 for their trip. Jacob earns \$100 a month doing landscaping on the weekends. Jacob decides he will put \$75 in his sock drawer every month for the next 48 months. Antonio likes his weekends for himself, so instead of working he sold his baseball card collection for \$2,400 and put the money in a bank account earning 10% interest, compounded monthly. Whose method will result in the most money saved? Will the boys have enough money saved in time for their trip?

These equations represent the boys' saving techniques, for which y_{Jacob} and y_{Antonio} are in dollars:

$$y_{\text{Jacob}} = 75(x)$$

$$y_{\text{Antonio}} = 2400(1.10)^{\frac{x}{12}}, \text{ where } x \text{ is in months}$$

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Coaching

- a. Who will have saved more money in 1 year?

- b. Who will have saved more money in 2 years?

- c. Who will have saved more money in 3 years?

- d. Who will have saved more money in 4 years?

- e. Will either of the boys have enough money saved at the end of 4 years?

- f. Graph y_{Jacob} and y_{Antonio} , noting where the graphs cross.

- g. Use a table of values to approximate the month when one boy's savings surpasses the other's.