JCPS

JEFFERSON COUNTY PUBLIC SCHOOLS DIGITAL: NTI

Supplemental Practice for ALGEBRA 1

Packet #3

The material in this packet is to be used as extra practice for students who would like to extend their learning once they have completed the Choice Boards for their grade level.

The expected time frame for this practice is approximately 2 weeks.

Graphing in Context

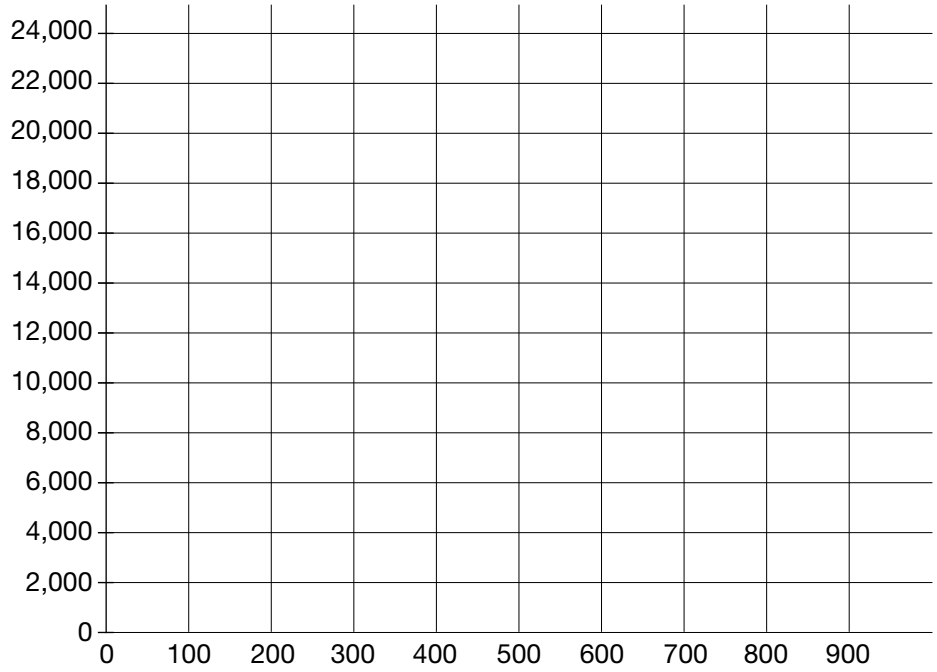
Carole owns a t-shirt company where she both designs and produces t-shirts for local individuals and businesses. Carole paid $18,000 for the printing machine and it costs an additional $5 for each t-shirt produced. An equation to model this situation is below:

$$C = 18{,}000 + 5t$$

1. What is the y-intercept and what does it mean in the context of this problem?

2. What is the slope and what does it mean in the context of this problem?

3. Graph the equation.



Task: Writing Linear Equations in Context

For each of the situations determine the slope, y-intercept, and x-intercept, along with each of their real-world meanings, when applicable. Additionally, write an equation to model the situation. Each equation should be written in the form most appropriate for the information provided.

1. To prepare for a recent road trip, Jill filled up her 19-gallon tank. She estimates that her SUV will use about three gallons per hour. Write an equation to model the amount of gasoline, G, remaining in her tank after t hours.

   Slope: _____
   Real-world meaning:

   _____

   y-intercept: _____
   Real-world meaning:

   _____

   x-intercept: _____
   Real-world meaning:

   _____

   Equation: _____

2. Roberto deposits the same amount of money each month into a checking account. Use the table to write an equation to model his balance, B, after m months.

# of months	1	3	6
Balance	255	365	530

   Slope: _____
   Real-world meaning:

   _____

   y-intercept: _____
   Real-world meaning:

   _____

   x-intercept: _____
   Real-world meaning:

   _____

   Equation: _____

3. Let f be the function that assigns to a temperature in degrees Celsius its equivalent in degrees

Fahrenheit. The freezing point of water in degrees Celsius is zero while in degrees Fahrenheit it is 32. The boiling point of water is 100 degrees Celsius and 212 degrees Fahrenheit. Given that the function *f* is linear, use this information to find an equation for *f*.

Slope: _____
Real-world meaning:

_____

y-intercept: _____
Real-world meaning:

_____

x-intercept: _____
Real-world meaning:

_____

Equation: _____

4. At the beginning of October, Monique changed banks and decided to leave the remaining $3900 in her old checking account to pay for rent. After six months, her balance was finally zero. If the balance, B, in Monique's account is a function of time, *t*, write an equation for the situation.

Slope: _____
Real-world meaning:

_____

y-intercept: _____
Real-world meaning:

_____

x-intercept: _____
Real-world meaning:

_____

Equation: _____

5. On a recent scuba diving trip, Kate and Kara reached a depth of 130 feet. Six-and-a-half minutes later after ascending at a constant rate, they reached the surface. Write an equation to represent their distance, D, as a function of time, *t*.

Slope: _____
Real-world meaning:

_____

y-intercept: _____
Real-world meaning:

_____

x-intercept: _____
Real-world meaning:

_____

Equation: _____

Task: More Modeling with Functions

1. A student has had a collection of baseball cards for several years. Suppose that B, the number of cards in the collection, can be described as a function of t, which is time in years since the collection was started. Explain what each of the following equations would tell us about the number of cards in the collection over time.

(a) $B = 200 + 100t$

(b) $B = 100 + 200t$

(c) $B = 2000 - 100t$

(d) $B = 100 - 200t$

2. Which of the following could be modeled by y = 2x + 5? Answer YES or NO for each one.

(a) There are initially five rabbits on the farm. Each month thereafter the number of rabbits is two times the number in the month before. How many rabbits are there after *x* months?

☐ Yes ☐ No

(b) Joaquin earns $2.00 for each magazine sale. Each time he sells a magazine he also gets a five-dollar tip. How much money will he earn after selling *x* magazines?

☐ Yes ☐ No

(c) Sandy charges $2.00 an hour for babysitting. Parents are charged $5.00 if they arrive home later than scheduled. Assuming the parents arrived late, how much money does she earn for *x* hours?

☐ Yes ☐ No

(d) I have a sequence of integers. The first term of the sequence is 7 and the difference between any consecutive terms is always equal to two.

☐ Yes ☐ No

(e) Sneak Preview is a members-only video rental store. There is a $2.00 initiation fee and a $5.00 per video rental fee. How much would John owe on his first visit if he becomes a member and rents *x* videos?

☐ Yes ☐ No

(f) Andy is saving money for a new CD player. He began saving with a $5.00 gift and will continue to save $2.00 each week. How much money will he have saved at the end of *x* weeks?

☐ Yes ☐ No

3. A checking account is set up with an initial balance of $4800, and $400 is removed from the account each month for rent (no other transactions occur on the account).

(a) Write an equation whose solution is the number of months, *m*, it takes for the account balance to reach $2000.

_____

(b) Make a plot of the balance after m months for m=1,3,5,7,9,11 and indicate on the plot the solution to your equation in part (a).

Independent Practice

Write an equation to model each of the situations.

1. Cedric and Josh both ordered the same size pizzas at Marco's Pizzeria; however, they ordered different toppings. Marco's charges an additional fee for toppings, but all toppings cost the same. Cedric got pepperoni, banana peppers, and black olives on his pizza for a cost of $15.74. Josh ordered mushrooms and eggplant on his pizza and paid $14.49. Using this information, write an equation for the cost of a pizza, C, as a function of the number of toppings, *t* ordered.

2. College tuition at Bedrock University has increased $500 per year for the past six years. Wilma is a freshmen this year and paid $10,250 for her tuition. She is curious about her tuition in the coming years and needs this information as motivation to graduate in four years. Assuming the tuition rate increase remains constant, write an equation to represent the tuition at Bedrock University in *x* years.

3. Moche started a summer business of mowing lawns. However, before he could mow lawns, he needed to purchase supplies (a lawnmower among other needs). Moche spent $395 gathering necessary materials. He makes on average $60 per lawn, mowed. Write an equation to show Moche his earnings for *l* lawns mowed.

4. Margaret purchased a new bar of soap. Three days after she originally used the soap, she was curious how much soap per day she was using. She decided to weigh her soap and found that the bar was 103 grams. Four days later she re-measured the same bar of soap and recorded a weight of 80 grams. Assuming that Margaret uses the same amount of soap daily (and that she used the soap daily), write an equation that shows the amount of soap remaining after *d* days of use.