Assignment

Write

Explain how the constant term and the coefficient of the variable of $y = 2x + 5$ would be represented in the graph of the equation.

Remember

A table provides specific values for a given problem situation. A graph is a visual representation of the data related to a problem situation. An equation generalizes a problem situation.

Practice

1. Ben joins a book club. He pays $12 for each book and $5 for shipping and handling charges for each order.
   a. Name the quantities that change in this problem situation and the quantities that remain constant. Determine which quantity is independent and which quantity is dependent.
   b. Create a table of values to represent the total cost if Ben orders 1 or 2 books or spends $41, $65, or $125.
   c. Create a graph of the data from the table. Carefully select the lower bound, upper bound, and intervals. Remember to label the axes and the intervals.
   d. Describe the relationship between the two quantities. Define your variables.
   e. Ben said that he spent exactly $80 on a book order. Use your graph to determine if Ben is correct.
   f. Write an algebraic equation to represent the situation.
   g. Use the equation, table, and graph to explain if this situation represents a proportional relationship.
2. Mr. Hong is a rare coin collector. He recently bought a coin valued at $5400. It has been determined that the coin will increase in value by $30 each month. Mr. Hong plans to sell the coin within 5 years.
   a. Name the quantities that change in this problem situation and the quantities that remain constant. Determine which quantity is independent and which quantity is dependent.
   b. Create a table of values that represents a variety of different number of months for which Mr. Hong could own the coin and the total value of the coin.
   c. Create a graph of the data from the table. Carefully select the lower bound, upper bound, and intervals. Remember to label the axes and the intervals.
   d. Describe the relationship between the two quantities.
   e. Use the graph to determine the approximate worth of the coin if Mr. Hong owns it for 3 years.
   f. Use the graph to determine approximately when will the coin be worth $6600.
   g. Write an algebraic equation to represent the situation. Define your variables.
   h. After owning the coin for 3 years, Mr. Hong wants to sell the coin. He tells a potential buyer it is worth $6480. The buyer disagrees and says it is worth $5490. Who is correct? Explain your reasoning in terms of the equation.

3. Tristan is looking for a new car. He has particular interest in an expensive sports car with a list price of $32,500. Tristan knows that the minute he drives the car off the lot, it will start to lose value, or depreciate. He finds out that the car will depreciate to a scrap value of $1000 in 15 years.

   a. What is the total change in value of the car in 15 years?

   b. What is the average amount of depreciation per year?

   c. When the car is exactly 7.5 years old, Tristan decides to sell it to his friend Jovann. What is the value of the car when Jovann buys it?

   d. What are the two quantities that are changing in part (c)? Define and identify the independent and dependent variables for the quantities you defined with their units of measure.

   e. Write an equation to calculate the value of the car given the number of years Jovann has owned the car.

   f. Create a table of values that includes when Jovann has owned the car 0 years, 6 months, and two and a half years. Also, include when the value of the car was $1000, $22,000, $25,150, $30,400, and $32,500.

   g. Create a graph of the data from the table. Carefully select the lower bound, upper bound, and intervals. Remember to label the axes and the intervals.

   h. Locate the point where the value of the independent quantity is −5. What is the value of the dependent quantity at this point? Write the point as an ordered pair. What does the ordered pair mean in the context of the problem?

Stretch

Write a linear problem situation in which negative values of both the independent and dependent variables are useful in analyzing the situation. Write the related equation and create a graph of the situation.

Review

1. Mr. Hong has coins and old stamps for sale. He decides to advertise the items on an internet site for collectors. It will cost him $84 initially to advertise and $28 for each day he keeps the items on sale. If Mr. Hong does not want to spend more than $700 on advertising, what is the maximum number of days he should advertise? Write and solve an inequality to answer the question.

2. Solve and graph the inequality: $-2x + 3 < 12$

3. Solve each equation. Check your solution.

   a. $16 = 3x - 4$ b. $1.2x + 5.3 = 5.9$

4. Use long division to convert each fraction to a decimal. Identify each decimal as terminating or non-terminating.

   a. $\dfrac{5}{9}$ b. $\dfrac{11}{20}$