Modeling Linear Functions Practice

1. An airplane 30,000 feet above the ground begins descending at the rate of 2000 feet per minute. Assume the plane continues at the same rate of descent. The plane's height and minutes above the ground are related to each other.

   a. What is the slope of this situation?

   -2,000 feet per minute

   b. What is the y-intercept of this situation?

   30,000 y-int: Start. one-time.

   c. Write an equation to represent this situation

   $y = 30,000 - 2000x$ or $y = -2000x + 30,000$

   d. Use the equation to find the altitude of the plane after 5 minutes.

   $2000(5) = 10000$ $\quad 30,000 - 10,000 \rightarrow$ 20,000 feet

2. Suppose you receive \$100 for a graduation present, and you deposit it ~~in a savings~~ account. Then each week thereafter, you add \$5 to the account but no interest is earned. The amount in the account is a function of the number of weeks that have passed.

   a. What is the slope of this situation?

   \$5 per week

   b. What is the y-intercept of this situation?

   \$100

   c. Write an equation to represent this situation

   $y = 5x + 100$ $\qquad y = 100 + 5x$

   d. Use the equation to find how long it will take for the account to have \$310.

   \$310
   −100
   \$210 ÷ 5 = 42 weeks

3. The equation $y = -5x + 50$ represents money Steve is given to spend while on a vacation where x is the number of days and y is the amount of money left.

   a. What do the slope and y-intercept mean in the context of the problem?

Slope: He spends $5 per day Y-int: He started w/ $50

   b. Use the equation to find when Steve will have $15 left.

50 − 15 = 35

35/5 = 7 days

4. The equation $y = 3x + 15$ represents the height of a tree Julio planted where x is the number of years that has passed since Julio planted the tree and y is the height of the tree in feet.

   a. What do the slope and y-intercept mean in the context of the problem?

Slope: Grows 3 ft per year Y-Int: Original height of 15 ft.

   b. How long will it take the tree to reach a height of 51 feet?

51 − 15 = 36 ÷ 3 = 12 years

5. The equation $y = 2.50x - 50$ represents the amount of money Patty makes selling cookies where x is the number of cookies sold and y is the total profit.

   a. What do the slope and y-intercept mean in the context of the problem?

Slope: Each cookie costs $2.50 Y-Int: Spent $50 on supplies

   b. How many cookies will Patty need to sell to start making a profit?

50/2.50 = 20 cookies to earn $50

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