

Name: _____ Date: _____ Period: _____

M3 T2 L4: Writing Equations Classwork

Define the variables in each given problem. Then, write an equation that models the problem situation.

1. A builder requires a certain number of bricks each time he builds a brick house. To make sure he has enough bricks, he always orders 50 additional bricks to account for any bricks that are broken during the construction.

Define variables for the number of bricks required for a house and the number of bricks ordered.

Write an equation that models the relationship between these variables.

$$r = \# \text{ of bricks required} \quad b = \# \text{ of bricks ordered}$$

$$r + 50 = b$$

Then, solve your equation to answer how many bricks will he need to order if the house requires 213 bricks.

$$213 + 50 = b$$

$$263 = b$$

263 bricks ordered

Finally, solve your equation to answer how many bricks a house required if he ordered 1,500 bricks.

$$\begin{array}{r} r + 50 = 1500 \\ - 50 \quad - 50 \\ \hline r = 1450 \text{ bricks required} \end{array}$$

2. On Patricia's dairy farm, her cows produce an average of 3.8 gallons of milk per minute during milking time.

Define variables for the number of gallons of milk produced and the number of minutes spent milking. Write an equation that models the relationship between these variables.

$$g = \text{gallons of milk produced} \quad m = \# \text{ of minutes}$$

$$3.8m = g$$

Then, solve your equation to answer how many gallons of milk are produced in 5 minutes.

$$\begin{array}{r} 3.8(5) = g \\ 19.0 = g \end{array}$$

19 gallons of milk

Finally, solve your equation to answer how many minutes milking time lasted if 11.4 gallons were produced.

$$\begin{array}{r} 3.8m = 11.4 \\ 3.8 \quad 3.8 \\ \hline m = 3 \text{ minutes} \end{array}$$

3. Zack and Malachi have a lemonade stand. They make a profit of \$2.50 for each gallon of lemonade sold. Define variables for the total profit Zack and Malachi make from their lemonade stand and the number of gallons sold. Write an equation that models the relationship between these variables.

$$p = \text{profit} \quad g = \text{gallons sold}$$

$$2.50g = p$$

Then, solve your equation to answer how much profit was made from selling 13 gallons.

$$2.50(13) = p$$

$$32.50 = p$$

Finally, solve your equation to answer how many gallons were sold if they made a profit of \$45.

$$\frac{2.50g}{2.50} = \frac{45}{2.50}$$

$$g = 18 \text{ gallons}$$

4. In the Kentucky Derby, the total weight of each jockey and their gear must be exactly 126 pounds.

Define variables for the weight of a jockey and the weight of the jockey's gear. Write an equation that models the relationship between these variables.

$$j = \text{jockey's weight} \quad g = \text{gear weight}$$

$$j + g = 126$$

Next, solve your equation to show how much the gear can weigh for a 101-pound jockey.

$$101 + g = 126$$

$$g = 25 \text{ pounds of gear}$$

Finally, solve your equation to show how much a jockey can weigh if he has 38 pounds of gear.

$$j + 38 = 126$$

$$j = 88 \text{ pound jockey}$$

5. A department store adds a \$4.99 processing fee to the cost of any merchandise purchased through their website.

Define variables for the total cost of an order and the cost of the merchandise ordered. Write an equation that models the relationship between these variables.

$$t = \text{total cost} \quad m = \text{cost of merchandise}$$

$$m + 4.99 = t$$

Next, solve your equation to determine the cost of the merchandise if the total cost was \$25.72.

$$\begin{array}{rcl} m + 4.99 & = & 25.72 \\ - 4.99 & & \hline m & = & \$20.73 \end{array}$$

cost of merchandise

Finally, solve your equation to determine the total cost if the merchandise cost \$100.00.

$$100 + 4.99 = t$$

$$\$104.99 = t$$

$\$104.99$ is the total cost

6. An aluminum baseball bat factory produces 900 aluminum bats for every ton of aluminum they use.

Define variables for the number of aluminum bats produced and the number of tons of aluminum used. Write an equation that models the relationship between these variables.

$$b = \text{bats produced} \quad t = \text{tons of aluminum}$$

$$900t = b$$

Next, solve your equation to determine how many bats were produced from 1.2 tons of aluminum.

$$900(1.2) = b$$

$$1080.0 = b$$

1080 bats produced

Finally, solve your equation to determine how many tons of aluminum were used to produce 1,350 bats.

$$\frac{900t}{900} = \frac{1350}{900}$$

$$t = 1.5 \text{ tons of aluminum}$$

$$\begin{array}{r} 1.5 \\ \hline 900 \overline{)1350.0} \\ -900 \\ \hline 450 \\ -450 \\ \hline 0 \end{array}$$