

## Unit 2: Equations

### Worksheet 4: Writing & Solving Equation – Word Problems

### Modeling

This lesson & practice will demonstrate the use of previously learned algebraic techniques in solving real world linear scenarios. The key to doing all of these problems is to **read the problem as many times as necessary to understand what is being asked.**

#### STEPS IN SOLVING WORD PROBLEMS WITH LINEAR ALGEBRA

1. Define the variable that you want to find with a let statement.
2. Create an equation that expresses the information given in the problem's scenario.
3. Solve your equation using algebraic methods.
4. Consider if your answer is reasonable.
5. Label your solution appropriately.
6. Check your answer with the conditions given in the problem.

**Exercise #1:** At a concert, Nabila purchased three t-shirts and a concert program that cost \$15. In total, Nabila spent \$90. Find the cost of a single t-shirt if they all had the same price.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

**Exercise #2:** Oberon Cell Phone Company advertises service for 3 cents per minute plus a monthly fee of \$29.95. If Parker's phone bill for October was \$38.95, find the number of minutes he used.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

**Exercise #3:** Quin was shopping at a used book sale where all books were selling at the same price. He bought six science fiction books and eight mysteries. He also decided to buy a poster for \$2.40. In total, Quin spent \$8.70. What was the price of a single book?

1.

4.

2.

5.

3.

6.

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### Now you do it!

1. Rachael and Sabine belong to different local gyms. Rachael pays \$35 per month and a one-time registration fee of \$15. Sabine pays only \$25 per month but had to pay a \$75 registration fee. After how many months will Rachael and Sabine have spent the same amount on their gym memberships?
2. While on vacation, Talisha won a lot of tickets at two arcades on the boardwalk she was visiting. The first arcade charges \$1 to cash in the tickets and gives you 12 cents back on each ticket won, while the second arcade gives you 10 cents back on each ticket and no fee to cash in. In order for Talisha to make an equal profit from each arcade, how many tickets must she have won?

3. Ulani has an older sister and a younger sister. Her older sister is one year more than twice Ulani's age. Ulani's younger sister is three years younger than she is. The sum of their three ages is 26. Find Ulani's age.
  
4. A sale at a local grocery store was offering all fruit at the same price per pound. Valencia bought 1.5 pounds of peaches and 3.5 pounds of plums. She used a 50 cents off coupon and ended up spending exactly \$5.00. What was the price per pound for the fruit that Valencia bought?
  
5. Wade purchased three videos and one music CD. The CD cost Wade \$12.99. If he paid the same amount for each video and spent a total of \$42.96, how much did each video cost?
  
6. At the market, Xiang bought a bunch of bananas for \$0.35 per pound and a frozen pizza for \$4.99. The total for Xiang's purchase was \$6.04 without tax. How many pounds of bananas did Xiang buy?
  
7. Yamir went to the store to buy gardening supplies. A bag of dirt was \$3.99 and tulips cost 75 cents per bulb. He bought one bag of dirt and some tulip bulbs and spent a total of \$12.24 without tax. How many bulbs did Yamir buy?

8. Zoe is comparing two local yoga programs. Yoga-Weigh charges \$90 dollars a month and a registration fee of \$35. Essence of Yoga charges \$80 per month with a \$75 registration fee. After how many months will the two schools charge the same amount?

9. Abbey and Blanca are playing games at the arcade in the mall. Abbey has \$20 and is playing a game that costs 50 cents per game. Blanca arrived at the arcade with \$22 and is playing a game that costs 75 cents per game.

a) Create two linear equations below that give the amount that each girl has left as a function of the number of games they have played.

Let the number of games played =  $x$ .

$A =$

$B =$

b) After how many games will the two girls have the same amount of money left?

c) How much money do they have at this point?

10. The length of a rectangular garden is three feet more than twice its width.

a) If the width of this garden is given by  $w$  then write an expression, in terms of  $w$ , for the length,  $l$ , of the garden.

b) Write an expression, in terms of  $w$ , for the perimeter of the garden. Remember, the perimeter is the sum of the two widths and the two lengths.

c) If the perimeter of the garden is 114 feet, then what is the width of the garden?