



**DeSoto**  
COUNTY SCHOOLS

**Yearlong/Semester**  
**Algebra I**

**Week 7**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### More Practice Solving Linear Equations Algebra 1 Classwork and Homework

At this point we have seen all of the fundamental techniques that we need to solve linear equations. This problem set serves to reinforce all of these skills and concepts.

#### Skills

1. Which of the following is the solution to the equation  $4(x-1) = 3(2x-6) + 4$ ?

(1) 9

(3) 5

(2) -4

(4) -17

2. Which of the following solves the equation  $8 - (2x - 6) = 22$ ? \_\_\_\_\_

(1) -10

(3) 0

(2) -4

(4) 7

3. Which expression is equivalent to  $5(3x+7) - (4x-6)$ ? \_\_\_\_\_

(1)  $11x + 41$

(3)  $19x - 29$

(2)  $11x + 29$

(4)  $19x + 29$

4. Solve each of the following linear equations. Check your answers using **STORE**.

(a)  $3(2x+1) - 7 = 50$

(b)  $3(x-5) = -2(4-5x)$

(c)  $5(x+1) = 2(4x+7)$

(d)  $2(2x+5) = 8x-4$

(e)  $5(x+6) = 8x+75$

(f)  $2x - (4x-12) = 3$

5. Solve each of the following linear equations. Check your answers using **STORE**.

(a)  $4(x+1) - 3(2x+6) = -11$

(b)  $4(2x+1) - (3x-10) = -21$

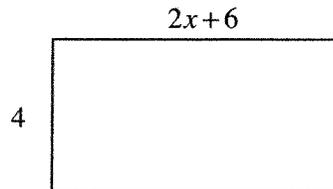
(c)  $3x - 5(2x - 6) = 9(2 - x)$

(d)  $4(2x+1) - 3(2x-5) = 29$

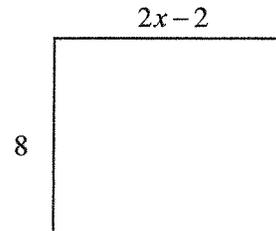
### Applications

6. The two rectangles shown below (*not drawn to scale*) have side lengths given in terms of  $x$  and have equal areas.

(a) Determine the value of  $x$ .



(b) Determine the common area of the rectangles.



(c) What type of special rectangle is the second one? Explain.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Linear Word Problems Algebra 1

This lesson 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.**

**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.

### 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 #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.

**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?

**Exercise #4:** 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?

**Exercise #5:** 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?

**Exercise #6:** 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.

**Exercise #7:** 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?

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## **Linear Word Problems Algebra 1 Homework**

### **Applications**

1. 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?
  
  
  
  
  
  
  
  
  
  
2. 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?
  
  
  
  
  
  
  
  
  
  
3. 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?
  
  
  
  
  
  
  
  
  
  
4. 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?

5. 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 =  $x$ .

$A =$

$B =$

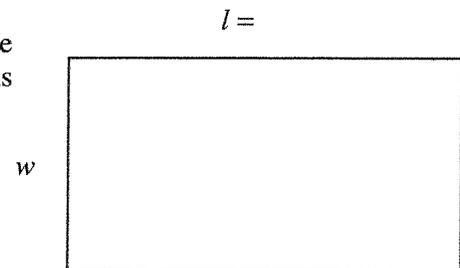
(b) After how many games will the two girls have the same amount of money left?

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

6. 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?

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Modeling with Linear Functions Algebra 1

We have learned that slope is used to describe real life rates of change. We also know that the  $y$ -intercept is where the line begins on the  $y$ -axis. The  $y$ -intercept always occurs where the independent variable has a value of zero. Using these two quantities, slope and  $y$ -intercept, we can model and solve many real life problems.

**Exercise #1:** The Arlington Freshmen class wants to have a fundraiser. The class wants to buy a number of \$4 flip-flops and \$5 bracelets. The class has a total of \$100 to spend.

- (a) If  $x$  represents the number of flip-flops and  $y$  represents the number of bracelets, complete the table below.

# of flip-flops, $x$	0	
# of bracelets, $y$		0

- (b) Using the two points from part (a), write a linear equation in  $y = mx + b$  form that gives the number of bracelets that can be bought as a function of the number of flip-flops bought.

- (c) Using your equation from (b), determine the number of bracelets that can be bought if 10 flip-flops were purchased.

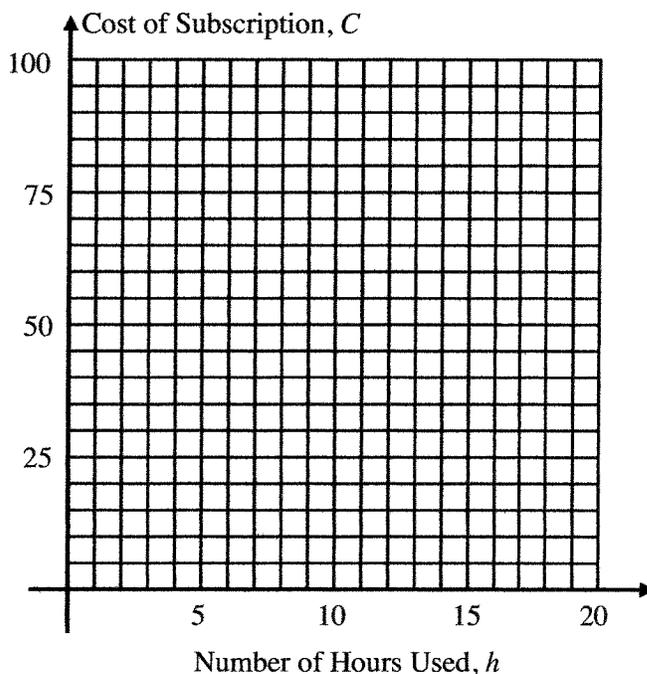
**Exercise #2:** From 2000 to 2007 the number of coffee shops in a certain country increased by 100 shops per year. In 2002, there were 1100 coffee shops.

- (a) Write a linear equation for the number of coffee shops,  $y$ , as a function of time,  $t$ , where  $t = 0$  represents the year 2000.

- (b) Based on your linear model from part (a), predict the number of coffee shops that will be in that country in 2025.

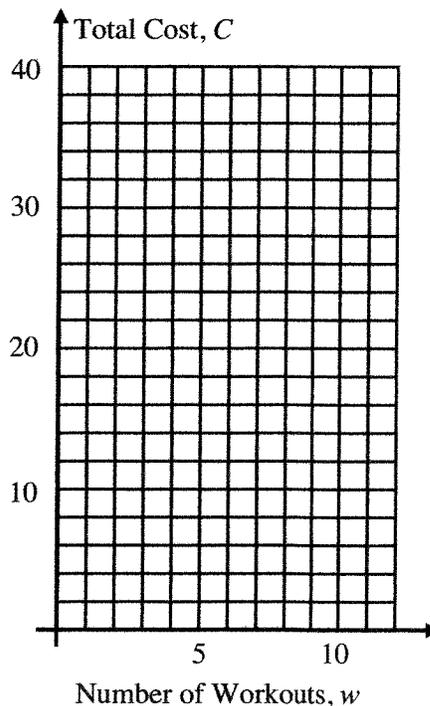
**Exercise #3:** The cost to subscribe to an online internet service consists of a \$15 per month flat-fee and a \$4.00 per hour additional charge.

- Create a linear model to represent the total cost per month,  $C$ , as a function of the number of hours,  $h$ , that are used.
- Using your calculator to generate a table of values, graph the model you formed in part (a) on the grid provided.
- Lucy was charged \$75 after signing up and using the service for one month. How many hours did she use? Justify your answer both algebraically and graphically.



**Exercise #4:** Shirley's Workout Shack charges \$6 to sign up and \$3 each time a person works out.

- Write an equation representing the cost,  $C_1$ , to workout at Shirley's as a function of the number of workouts a person has worked out,  $w$ .
- Tommy's Pump Up Center charges \$14 to sign up and \$2 for each workout. Create another linear function, as in part (a), for the cost,  $C_2$ , of attending Tommy's Center.
- Graph both equations on the grid to the right. What number of workouts will result in the same cost for both gyms?



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Modeling with Linear Functions Algebra 1 Homework

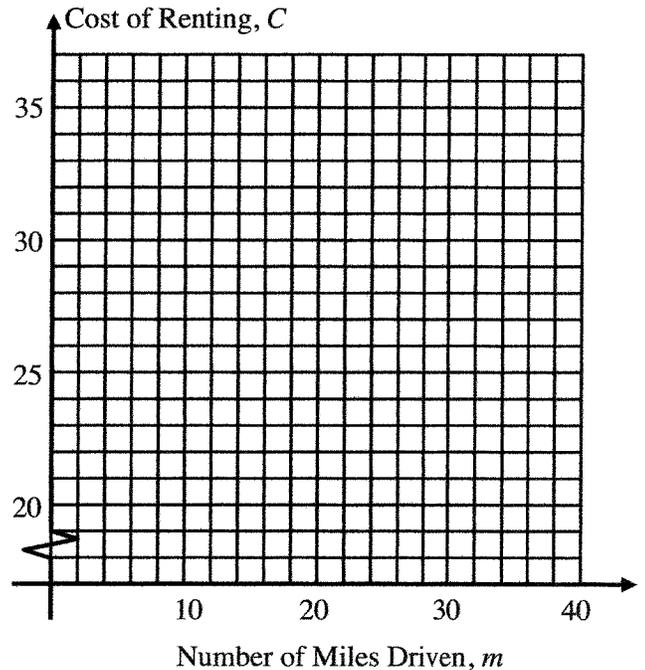
### Applications

1. Hamal Rental Cars charges a flat-fee of \$25 per day to rent a new Chevy Impala, plus a mileage charge of \$0.25 per mile.

(a) Write a linear equation to represent the cost,  $C_1$ , of renting an Impala as a function of the number of miles driven,  $m$ .

(b) On the grid to the right, graph and label the linear function you created in part (a).

(c) Ike's Rentals charges a flat fee of \$20 per day to rent an Impala plus a mileage charge of \$0.50 per mile. As in (a), write a linear equation to represent the cost,  $C_2$ , of renting an Impala from Ike's and graph this function on the grid at the right.



(d) For what number of miles,  $m$ , will the rental costs be equal for the two places?

2. Kael wants to install a new toilet. Luigi the plumber charges \$100 for the cost of the toilet plus an additional \$75 per hour.

(a) Write an linear equation that gives the cost,  $C_1$ , as a function of the hours,  $h$ , that Luigi works.

(b) Being very exact with his hours, Luigi charges Kael \$750. Determine, to the nearest *tenth of an hour*, how long Luigi worked on this job. Justify your answer using algebra or tables in your calculator. If you justify using a table, write at least three rows from your table.

3. Javier is trying to find a linear equation for the cost of his cell-phone plan. The first month he talks for only 32 minutes and is charged \$14.10. The second month he talks for 420 minutes and is charged \$33.50.

(a) Write two ordered pairs, where the minutes are the independent variable and the charge is the dependent variable, that model the information given in the problem.

(b) Using these two points, write a linear equation that gives Javier's charge,  $C$ , as a function of the number of minutes,  $m$ , that he talks.

(c) What does the slope of this linear function represent?

4. Miguel is driving towards New York City at a constant rate of speed. After 2 hours he notices that he is 127 miles away and after 3 hours he notices that he is 69 miles away.

(a) Write the information above as two ordered pairs, with time being the independent variable and the distance from New York City being the dependent variable.

(b) Using your ordered pairs from part (a), write a linear equation in which the distance Miguel is away,  $D$ , as a function of the time he has been driving,  $t$ .

(c) Why is the slope of your linear equation from part (b) negative? Explain in terms of the real-life scenario that the linear equation is modeling.

(d) How far from NYC was Miguel when he started his trip at  $t = 0$  hours? Justify.