Name _____ Period_____ Date_____

Solving Mathematical Problems Leading to Two Linear Equations in Two Variables

Use a system of equations to model each situation. Solve by any method.

1. The sum of two numbers is 30. The sum of the greater number and three times the lesser number is 54. Find the numbers.

2. Shopping at Savers Mart, Lisa buys her children four shirts and three pairs of pants for $85.50. She returns the next day and buys three shirts and five pairs of pants for $115.00. What is the price of each shirt and each pair of pants?

3. An amusement park charges admission plus a fee for each ride. Admission plus two rides costs $10. Admission plus five rides cost $16. What is the charge for admission and the cost of a ride?

4. Ralph and Jody go to the shop to buy potato chips and candy bars.

Ralph buys 3 bags of potato chips and 4 candy bars. He spends $3.75.
Jody buys 4 bags of potato chips and 2 candy bars. She spends $3.00.

Later Clancy joins Ralph and Jody and asks to buy one bag of potato chips and one candy bar from them. They need to work out how much he should pay.

Ralph writes $3p + 4b = 375$

a) If p stands for the cost, in cents, of a bag of potato chips and b stands for the cost, in cents, of a candy bar, what does the 375 in Ralph's equation mean?

b) Write a similar equation, using p and b, for the items Jody bought.

c) Use the two equations to figure out the price of a bag of potato chips and the price of a candy bar. Show your work.

potato chips_____

candy bar _____

d) Clancy has just $1. Does he have enough money to buy a bag of potato chips and a candy bar? *Explain.*

5. Two taxi companies charge different rates.

      Metro Taxi: $3.00 for the first mile and $2.50 for each additional mile

      City Taxi: $5.00 for the first mile and $2.25 for each additional mile

a) When will the two taxi companies cost the same?

b) Describe a situation in which it would make more sense to use Metro Taxi. Then describe a different situation in which it would make more sense to use City Taxi. *Explain.*

6. Bill wants to order new jerseys for his baseball team. He sees the following advertisements for two printing companies, 'PRINT IT' and 'TOP PRINT'.

PRINT IT

Get your baseball jerseys printed with your own team names here.

Only $21 per jersey.

TOP PRINT

We will print your baseball jerseys - just supply us with your design.

Pay a one-off setting up cost of $45; we will then print each jersey for only $18!

a) Give Bill some advice on which company he should buy from. Explain:

When should he choose "PRINT IT"?   When should he choose "TOP PRINT"?

b) A third company called "VALUE PRINTING" wants its prices to be between those of "PRINT IT" & "TOP PRINT". The company never wants to be the cheapest nor the most expensive. Complete the poster for the new company. *Show work*.

VALUE PRINTING

We print baseball jerseys.

Pay a one-off set up cost of $................

Then each jersey will cost $..................

7. Suppose you bought supplies for a party. Three rolls of streamers and fifteen party hats cost $30. Later, you bought two rolls of streamers and four party hats for $11. Write and solve a system of equations to determine the cost of streamers and party hats, find their costs.

8. Sam needs to rent a car for a one-week trip to Oregon. He is considering two companies:

   A+ Auto Rental: $175 plus $0.10 per mile

   Zippy Auto Rental: $220 plus $0.05 per mile.

   Write and solve a system of equations to determine when the rental costs are the same for both companies.