

## 7.1 Word Problems

Name \_\_\_\_\_ Section \_\_\_\_\_ Date \_\_\_\_\_

Here are 2 word problems that are explained in your textbook on pages 429-430. Try to complete them yourself. Then go to the book and correct them.

### ① Read Problem + Write Key Information

#### EXAMPLE 3 Standardized Test Practice

The parks and recreation department in your town offers a season pass for \$90.

- As a season pass holder, you pay \$4 per session to use the town's tennis courts.
- Without the season pass, you pay \$13 per session to use the tennis courts.

Which system of equations can be used to find the number  $x$  of sessions of tennis after which the total cost  $y$  with a season pass, including the cost of the pass, is the same as the total cost without a season pass?

### ② Define Variable(s) - remember units: (they are in problem)

$$X = \text{\# of tennis sessions}$$

$$Y = \text{TOTAL COST IN \$'S}$$

### ③ Define Equation(s): WRITE 2 EQUATIONS

$$\text{Eq1: Cost w/ PASS} \rightarrow Y = 90 + 3X$$

$$\text{Eq2: Cost No PASS} \rightarrow Y = 13X$$

KI: PASS = \$90 and pay \$4/court  
NO PASS - PAY \$13/court

EX #3 HELPS YOU REMEMBER TO WRITE KI, define variables, and define EQUATIONS.

#### EXAMPLE 4 Solve a multi-step problem

**RENTAL BUSINESS** A business rents in-line skates and bicycles. During one day, the business has a total of 25 rentals and collects \$450 for the rentals. Find the number of pairs of skates rented and the number of bicycles rented.



Solution

THE QUESTION HELPS DEFINE THE VARIABLES

STEP 2 Write a linear system. Let  $x$  be the number of pairs of skates rented, and let  $y$  be the number of bicycles rented.

$$\text{RENTALS: } X + Y = 25$$

$$\text{SALES: } 15X + 30Y = 450$$

STEP 4 Graph both equations. LABEL X+Y AXIS

STEP 5 Estimate the point of intersection. The two lines appear to intersect at (20, 5)

STEP 6 Check whether (20, 5) is a solution.

Rental EQ

$$X + Y = 25$$

$$20 + 5 = 25$$

Total Rentals

$$25 = 25 \checkmark$$

SALES EQ:

$$15X + 30Y = 450$$

$$15(20) + 30(5) = 450$$

$$300 + 150 = 450$$

skates \$15  
bikes \$30  
Total \$'s

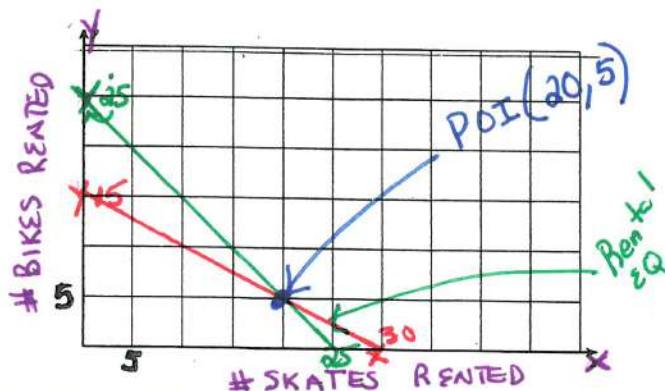
### STEP 1:

KI:

• INLINE SKATES \$15/DAY

• BIKES \$30/DAY

• 1 DAY SALES ARE 25 Rentals AND EARNED \$450



ALWAYS ASK YOURSELF. DOES THIS MAKE SENSE

Answer (in words)

The rented 20 skates and 15 bikes.

USE X+Y INTERCEPTS

Rental EQ

$$X + Y = 25$$

$$X: 25 \quad Y: 25$$

SALES EQ

$$15X + 30Y = 450$$

$$X: 30 \quad Y: 15$$

# SOLVING PROBLEMS WITH GRAPHS

Solve each problem by writing and graphing a system of equations that models the situation.

## Situation 1. ROCKET RIDE.

The Rocket Coaster has 10 cars, some that hold 4 people and some that hold 8 people. There is room for 56 people altogether. How many 4-passenger cars are there? How many 8-passenger cars are there?

Let  $x$  = number of 4-passenger cars

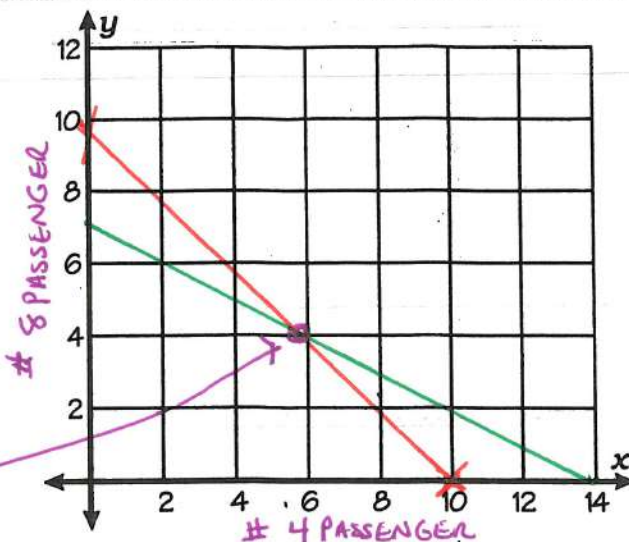
Let  $y$  = number of 8-passenger cars

# Cars equation #1:  $x + y = 10$  (x: 10, y: 10)

# people equation #2:  $4x + 8y = 56$  (x: 14, y: 7)

Solution: (6, 4)

6 4 passenger and 4 8-passenger cars



## Situation 2. FUN, FUN, FUN.

The cost of admission to Funland Park was \$70 for a group of 2 adults and 5 children. The admission was \$84 for another group of 4 adults and 3 children. Find the admission price for each adult and each child.

Let  $x$  = price of an adult's admission

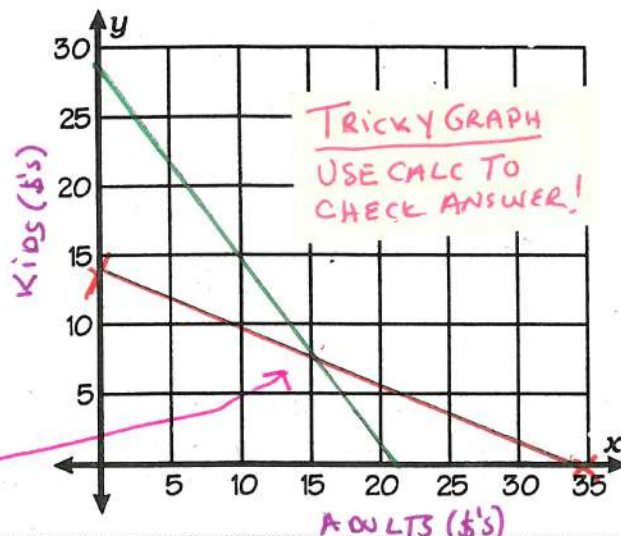
Let  $y$  = price of a child's admission

Group 1 equation #1:  $2x + 5y = 70$  (x: 35, y: 14)

Group 2 equation #2:  $4x + 3y = 84$  (x: 21, y: 28)

Solution: (15, 8)

\$15/Adult + \$8/Kid



## Situation 3. HOW ABOUT A KISS?

The number of calories in a chocolate kiss is 20 less than the number of calories in a caramel cluster. Three kisses plus four clusters together have 360 calories. How many calories are in each?

Let  $x$  = calories in a chocolate kiss

Let  $y$  = calories in a caramel cluster

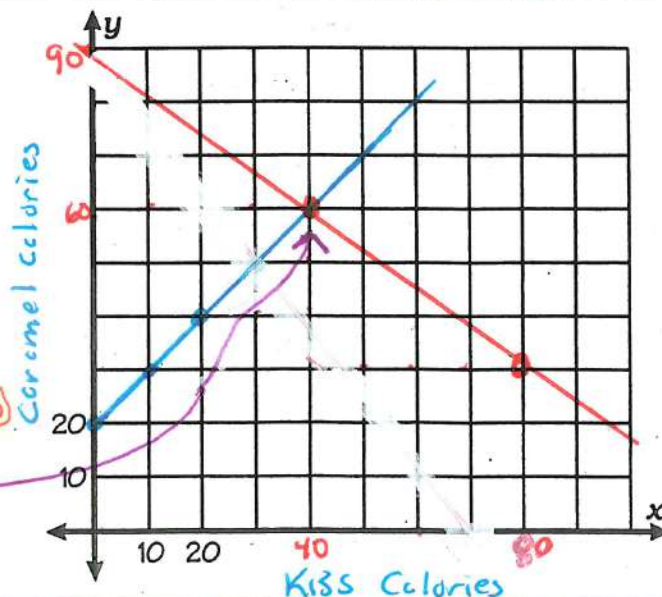
equation #1:  $x = y - 20 \rightarrow y = x + 20$

equation #2:  $3x + 4y = 360$   $y = -\frac{3}{4}x + 90$

Solution: (40, 60)

40 CAL PER CHOC. KISS AND

60 CAL PER CARAMEL CLUSTER



TO CHECK YOU'RE WORK... Add up the X and Y coordinates for the 3 solutions and they should sum to 133.