Name "Teacher" d5/6 Date Tu 2/6 **Section 2S5**

Substitution Word Problems

When 1 variable is given in terms of the other variable.

1) A particular Algebra textbook has a total of 1382 pages, which are broken into two parts. The second part of the book has 64 more pages than the first part. How many pages are in each part?

x - # of pages in part 1
y - # of pages in part 2

$x + y = 1382$
$y = x + 64$
$x + x + 64 = 1382$
$2x + 64 = 1382$
$-64 \quad -64$
$2x = 1318$
$x = 659$

$y = 659 + 64$
$y = 723$

Key Steps

1. Define variables in WORDS.
   unknowns?
2. Write two equations for the system.
3. Solve by substitution.
4. Use units in your final answer.

There are 723 pages in part 2 & 659 pages in part 1

2) Last season two running backs on the a football team rushed a combined total of 1550 yards. One rushed 4 times as many yards as the other. How many yards did each player rush?

x - yards of p1 (more)
y - yards of p2

$x + y = 1550$ ✔
$x = 4y$
$4y + y = 1550$
$5y = 1550$
$y = 310$

$x = 4(310)$
$x = 1240$

player 1 rushed 1,240 yards and player 2 rushed 310 yards.

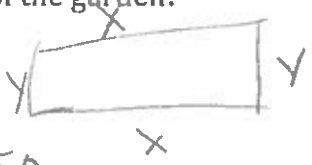
3) The perimeter of a rectangular garden is 50 feet. The length is five feet longer than the width. What are the dimensions of the garden?

perimeter = x + y + x + y

prectangluar = 2x + 2y

X - length

Y - width



$2x + 2y = 50$

$x = y + 5$

$2(y+5) + 2y = 50$

$2y + 10 + 2y = 50$

$4y + 10 = 50$

$-10 \quad -10$

$4y = 40$

$y = 10$

$x = 10 + 5$

$x = 15$

The length is 15 feet and width is 10 feet.

4) The sum of two numbers is 48. One of the numbers is three more than twice the first number. What are the two numbers?

The larger # is 33 and the smaller # is 15.

X - Larger #

Y - Small #

$x + y = 48$

$x = 2y + 3$

$2y + 3 + y = 48$

$3y + 3 = 48$

$-3 \quad -3$

$3y = 45$

$y = 15$

$x = 2(15) + 3$

$x = 30 + 3$

$x = 33$