

EXTRA PRACTICE 21
Solving Problems Using Systems Of Equations
 Use after Sections 8.2 - 8.4

Name _____

Example: The sum of two numbers is 95. One number is 16 less than twice the other. Find the numbers.

We let x represent one number and y represent the other number.

We solve the following system.

$$\begin{aligned} x + y &= 95, \\ x &= 2y - 16 \end{aligned}$$

Using the substitution method, we substitute $2y - 16$ for x .

$x + y = 95$	Then substitute 37 for y and solve for x .
$(2y - 16) + y = 95$	$x = 2y - 16$
$3y - 16 = 95$	$x = 2 \cdot 37 - 16$
$3y = 111$	$x = 58$
$y = 37$	

One number is 58, the other is 37.

This system could also have been solved using the elimination method.

$x + y = 95$	or	$x + y = 95$	or	$x + y = 95$
$x = 2y - 16$		$x - 2y = -16$		$-x + 2y = 16$
				$3y = 111$
				$y = 37$

Then substitute 37 for y and solve for x .

Solve.

1. Find two numbers whose sum is 49 and whose difference is 13. _____
2. Two angles are supplementary. One angle is 60° more than twice the other. Find the angles. _____
3. Two angles are complementary. Their difference is 36° . Find the angles. _____
4. The perimeter of a rectangle is 160 cm. The length is 4 less than three times the width. Find the length and the width. _____
5. A-1 Rental rents a basic car at a daily rate of \$29.95 plus 15¢ per mile. Another company rents a basic car for \$24.95 plus 20¢ per mile. For what mileage is the cost the same?

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6. There were 239 people at a concert. Admission was \$15 each for adults and \$5.50 each for children. The receipts were \$2758.50. How many adults and how many children attended?

7. A chemist has one solution that is 20% acid and a second that is 65% acid. How many gallons of each should be mixed together to get 120 gallons of a solution that is 50% acid?

8. The Calhouns generate one and a half times as much trash as their neighbors, the Millers. Together, the two households produce 15 bags of trash each month. How much does each household produce? _____
9. The Candy Shack has 20 lb of mixed white and dark chocolates worth \$7.50 per pound. White chocolates alone sell for \$8.00 per pound and dark chocolates sell for \$6.00 per pound. How many pounds of each are in the mixture? _____
10. A collection of quarters and nickels is worth \$3.70. There are 22 coins in all. How many of each are there? _____