Homework Solutions

15) $-10x + 7y = 12$
$-3x + 6y = -12$
$(-4, -4)$

16) $-3x + 4y = 2$
$-5x + 3y = 29$
$(-10, -7)$

Homework Solutions

17) $-10x - 6y = -14$
$8x + 5y = 11$
$(2, -1)$

18) $-3x - 2y = 8$
$-8x - 7y = 18$
$(-4, 2)$

Systems of Equations Word Problems

Write the following as algebraic equations involving 2 variables.

a) The sum of 2 numbers is 50

$x + y = 50$

equation 1

b) The difference between 2 numbers is 40

equation 2

$x - y = 40$

x, y

$(45, 5)$

① $x + y = 50$

② $x - y = 40$

① + ② $2x = 90$

$\frac{2x}{2} = \frac{90}{2}$

$x = 45$

sub into ①

$x + y = 50$

$45 + y = 50$

$-45 \quad -45$

$45 + y = 50$

$y = 5$

Eliminate

c) There are a total of 35 boys and girls in the class.

equation 1 ① $b + g = 35$

There are 5 more boys then girls ② $b - g = 5$

equation 2

① + ② $2b = 40$

$\frac{2b}{2} = \frac{40}{2}$

$b = 20$

$b + g = 35$

$20 + g = 35$ (-20 -20)

$g = 15$

Solving Problems in 2 variables

Some problems of business and industry are solved by expressing the problems as a system of equations.

Example 1:

The sum of two numbers is thirty and their difference is 174. Find the numbers.

① $x + y = 30$

② $x - y = 174$

① - ② $2x = 204$

$\frac{2x}{2} = \frac{204}{2}$

$x = 102$

Sub into ①

① $x + y = 30$

$102 + y = 30$ -102 -102

$y = -72$

Example 2:

When 4 times the larger of 2 numbers is added to 3 times the smaller the result is 68. Seven times the larger less 5 times the smaller is 37. Find the numbers.

let x represent larger #

let y represent small #

① $4(x) + 3(y) = 68$ $\xrightarrow{\times 5}$ ③ $20x + 15y = 340$

② $7x - 5y = 37$ $\xrightarrow{\times 3}$ ④ $21x - 15y = 111$

③ + ④ $41x = 451$

$\frac{41x}{41} = \frac{451}{41}$

$x = 11$