6.3 Solve Linear Systems Using Elimination

The idea behind this method is that we want to

ELIMINATE

one of the variables.

When do terms cancel??

When their coefficients are opposites!

Solve each linear system.

1. $4x + 3y = 16$
   $2x - 3y = 8$

$6x = 24$

$\frac{6x}{6} = \frac{24}{6}$

$x = 4$

$(4, 0)$

$4(4) + 3y = 16$

$16 + 3y = 16$

$-16 \quad -16$

$3y = 0$

$\frac{3y}{3} = \frac{0}{3}$

$y = 0$

2. $3a + 2b = 7$
   $-3a + 4b = 5$

$6b = 12$

$\frac{6b}{6} = \frac{12}{6}$

$b = 2$

$(1, 2)$

$3a + 2(2) = 7$

$3a + 4 = 7$

$-4 \quad -4$

$3a = 3$

$\frac{3a}{3} = \frac{3}{3}$

$a = 1$

Solve each linear system.

3. $4m - 2n = 2$
$-3m + 2n = 12$

$\frac{7m}{7} = \frac{14}{7}$

$m = 2$

$3(2) + 2n = 12$
$6 + 2n = 12$
$-6 \quad -6$

$\frac{2n}{2} = \frac{6}{2}$

$n = 3$

(2,3)

4. $5g + 2h = -4$
$-5g + 3h = 19$

$\frac{5h}{5} = \frac{15}{5}$

$h = 3$

$5g + 2(3) = -4$
$5g + 6 = -4$
$-6 \quad -6$

$\frac{5g}{5} = \frac{-10}{5}$

$g = -2$

(-2,3)

Solve each linear system.

5. $9x - 3y = 18$
$3y = -7x + 30$

$+7x \quad +7x$

$7x + 3y = 30$
$9x - 3y = 18$

$\frac{16x}{16} = \frac{48}{16}$

$x = 3$

$9(3) - 3y = 18$
$27 - 3y = 18$
$-27 \quad -27$

$\frac{-3y}{-3} = \frac{-9}{-3}$

$y = 3$

(3,3)

6. $3c = 2d - 6$
$3c + 4d = -6$

$-3c \quad -3c$

$2d = -3c - 6$
$+2d = +6$

$\frac{6d}{6} = \frac{0}{6}$

$d = 0$

$3c + 4(0) = -6$

$\frac{3c}{3} = \frac{-6}{3}$

$c = -2$

(-2,0)

Write and solve a system of equations.

7. The sum (add) of two numbers is 42.
Their difference (subtract) is 6.
Find the numbers.

1st # = x
2nd # = y

$1x + 1y = 42$
$1x - 1y = 6$
$2x = 48$
$\frac{2x}{2} = \frac{48}{2}$
$x = 24$

$24 + y = 42$
$-24 \quad -24$
$y = 18$

24 & 18

Write and solve a system of equations.

8. Roger is older than Ken.
The difference of their ages is 12
and the sum of their ages is 50.
Find the age of each.

x = Roger's age
y = Ken's age

$x - y = 12$
$x + y = 50$
$2x = 62$
$\frac{2x}{2} = \frac{62}{2}$
$x = 31$

$31 + y = 50$
$-31 \quad -31$
$y = 19$

Roger's age = 31
Ken's age = 19