

8.2 – SOLVING SYSTEMS ALGEBRAICALLY

Solve each system by ELIMINATION.

1. $5x - y = 12$

$+ 3x + y = 4$

$8x = 16$
 $x = 2$

$3(2) + y = 4$
 $6 + y = 4$
 $y = -2$

Solution: $(2, -2)$

3. $8m + 12n = 20$

$-5m + 12n = +1$

$3m = 21$
 $m = 7$

$8(7) + 12n = 20$
 $56 + 12n = 20$
 $12n = -36$
 $n = -3$

Solution: $(7, -3)$

2. $6c + 7d = -15$

$-6c + 2d = -12$

$9d = -27$
 $d = -3$

$6c - 2(-3) = 12$
 $6c + 6 = 12$
 $6c = 6$
 $c = 1$

Solution: $(1, -3)$

4. $4x - 3y = -2$

$2x + 3y = 26$

$6x = 24$
 $x = 4$

$2(4) + 3y = 26$
 $8 + 3y = 26$
 $3y = 18$
 $y = 6$

Solution: $(4, 6)$

Solve each system by SUBSTITUTION.

1. $y = 3x$

$x + y = 8$

Solve for a single variable

$y = 3x$

Substitute and Solve

$x + 3x = 8$
 $4x = 8$
 $x = 2$

Find other value and write solution

$y = 3x$
 $y = 3(2)$
 $y = 6$
 $(2, 6)$

2. $2x + y = 9$

$x + 4y = 1$

Solve for a single variable

$2x + y = 9$
 $y = -2x + 9$

Substitute and Solve

$x + 4(-2x + 9) = 1$
 $x - 8x + 36 = 1$
 $-7x = -35$
 $x = 5$

Find other value and write solution

$y = -2x + 9$
 $y = -2(5) + 9$
 $y = -10 + 9$
 $y = -1$
 $(5, -1)$

3. $2a - b = 1$

$5a - 3b = 0$

Solve for a single variable

$2a - b = 1$
 $-b = -2a + 1$
 $b = 2a - 1$

Substitute and Solve

$5a - 3(2a - 1) = 0$
 $5a - 6a + 3 = 0$
 $-a = -3$
 $a = 3$

Find other value and write solution

$b = 2a - 1$
 $b = 2(3) - 1$
 $b = 6 - 1$
 $b = 5$
 $(3, 5)$