

Showing all work on separate paper, solve the following SYSTEM OF EQUATIONS with the indicated method.

EXAMPLE:

$$y = x + 2$$

$$2x - y = 1$$

$$2x - (x + 2) = 1$$

$$2x - x - 2 = 1$$

$$x - 2 = 1$$

$$x = 3$$

$$y = (3) + 2$$

$$y = 5$$

Substitute $(x + 2)$ from top equation in for y in bottom equation.
Solve for x .

Simplify left side by combining like terms.

Add 2 to each side.

Substitute value of variable just found (3 for x) in either original equation (ie, top) to find value of other variable (y).
Solve for y . Solution: (3, 5).

ELIMINATION BY SUBSTITUTION:

ANSWERS

$$1. \quad y = 2x + 3$$

$$3x + 4y = 23$$

$$2. \quad x + 2y = 11$$

$$y = 2x - 2$$

$$3. \quad x - y = 3$$

$$2x - 3y = -3$$

$$4. \quad x = 3y$$

$$x + 3y = 4$$

$$5. \quad y = 2x$$

$$2x - y = -1$$

EXAMPLE:

$$-7x + 4y = 6$$

$$7x + y = 19$$

$$-7x + 4y = 6$$

$$(+7x + y = 19)$$

$$5y = 25$$

$$y = 5$$

Since coefficients of x terms are additive inverses,
ADD (like terms of both) equations to eliminate x terms.

Divide each side by 5.

Follow same general (**bolded**) procedure in substitution method above. Substitute (5) for y in bottom equation to find x .

Subtract 5 from each side.

Solve for x . Solution: (2, 5)

ELIMINATION BY ADDITION OR SUBTRACTION:

$$1. \quad 2x - 3y = 19$$

$$2x + 3y = 13$$

$$2. \quad x + 4y = 6$$

$$x + 3y = 5$$

$$3. \quad 2x - y = -8$$

$$x = 7 + y$$

$$4. \quad 4x + 6y = 12$$

$$2x - 6 = -3y$$

$$5. \quad 5x - y = -3$$

$$2y = 10x - 7$$

EXAMPLE:

$$2x + 3y = 9$$

$$8x - 5y = 19$$

$$-4(2x + 3y = 9)$$

$$\underline{8x - 5y = 19}$$

$$-8x - 12y = -36$$

$$(+8x - 5y = 19)$$

$$-17y = -17$$

$$y = 1$$

Since the coefficient of the x term in the bottom equation (8) is a multiple of the coefficient of the x term in the top equation (2), multiply the entire top equation by -4 to create a coefficient of the top equation's x term that is the additive inverse of the coefficient of the bottom equation's x term.

Since coefficients of x terms are now additive inverses,
ADD (like terms of both) equations to eliminate x terms.

Divide each side by -17 .

Follow same general (**bolded**) procedure in substitution method above. Substitute (1) for y in top equation to find x .

Multiply 3 and 1, then subtract 3 from each side.

Divide each side by 2. Solution: (3, 1).

$$1. \quad 6x - 2y = 8$$

$$3x + 4y = 29$$

$$2. \quad 3x + 5y = 19$$

$$4x - 2y = 8$$

$$3. \quad 6x = 5y - 2$$

$$2x + 7y = -18$$

$$4. \quad 6x - 3y = 7$$

$$18x - 9y = 21$$

$$5. \quad x + 2y = 11$$

$$y = 2x - 2$$

$$6. \quad y = 2x + 3$$

$$3x + 4y = 23$$