

# SUBSTITUTION NOTES

WHEN BOTH EQUATIONS ARE IN SLOPE INTERCEPT FORM:

$$y = -3x + 4$$

$$y = -5x - 4$$

SINCE BOTH X EXPRESSIONS EQUAL Y WE SET THEM = TO EACH OTHER & SOLVE FOR X.

$$\begin{array}{r} \cancel{-3x} + 4 = -5x - 4 \\ + 3x \qquad \qquad + 3x \\ \hline 4 = -2x - 4 \\ + 4 \qquad \qquad + 4 \\ \hline \end{array}$$

$$\frac{8}{-2} = \frac{-2x}{-2} \quad x = -4$$

PLUG  $x = -4$  INTO ONE EQUATION

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

$$y = 12 + 4$$

$$y = 16$$

COMMON SOLUTION  $(-4, 16)$

WHEN 1 EQUATION IS IN SLOPE INTERCEPT FORM & 1 IS IN STANDARD FORM,

$$y = 3x + 2$$

$$3x - 3y = -30$$

SINCE  $y = 3x + 2$  WE WILL SUBSTITUTE  $3x + 2$  FOR  $y$  IN  $3x - 3y = -30$ :

$$3x - 3(3x + 2) = -30$$

DISTRIBUTE & SOLVE FOR  $x$ .

$$3x - 3(3x + 2) = -30$$

$$\cancel{3x} - \cancel{9x} - 6 = -30$$

$$-6x - 6 = -30$$

$$\begin{array}{r} +6 \quad +6 \\ -6x = -24 \\ \hline -6 \quad -6 \end{array}$$

$$x = 4$$

PLUG  $x = 4$  INTO 1 EQUATION

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

$$y = 12 + 2$$

$$y = 14$$

COMMON SOLUTION  
 $(4, 14)$

SOLVE BY SUBSTITUTION.

NAME \_\_\_\_\_

①

$$y = 3x - 9$$

$$y = -5x + 39$$

②

$$y = 5x + 15$$

$$y = -3x - 25$$

③

$$y = 2x - 25$$

$$y = -3x + 10$$

④

$$y = 9x - 25$$

$$y = -6x + 20$$

⑤

$$y = -3x + 6$$

$$y = 5x + 22$$

⑥

$$y = -3x + 9$$

$$y = 6x - 36$$

$$\textcircled{7} \quad y = 2x - 2$$
$$2x - 3y = -26$$

$$\textcircled{8} \quad y = -4x - 10$$
$$3x - 4y = 2$$

$$\textcircled{9} \quad y = 4x - 1$$
$$3x + y = 27$$

$$\textcircled{10} \quad x = 3y + 27$$
$$2x - 3y = 36$$

$$\textcircled{11} \quad y = 3x + 5$$
$$10x + 2y = 74$$

$$\textcircled{12} \quad x = 2y - 35$$
$$4y + 3x = 45$$