

7.2 Substitution

* Lion King & Circle of Life

Instead of graphing each & guessing where they intersect, we solve one equation for a variable (x or y) & plug it in the other.

① $2x + 4$ $x = 3$ $\begin{matrix} x & y \\ (3, & 10) \end{matrix}$

$$2(3) + 4$$

$$\begin{matrix} 6 + 4 \\ \textcircled{10} \end{matrix}$$

② $3x + 2y = 7$ $y = 1$ $\begin{matrix} x & y \\ (\frac{5}{3}, & 1) \end{matrix}$

$$3x + 2(1) = 7$$

$$3x + 2 = 7$$

$$\begin{matrix} 3x - 2 = 7 \\ -2 \\ \hline 3x = 5 \\ \frac{3x}{3} = \frac{5}{3} \\ x = \frac{5}{3} \end{matrix}$$

③ $x + 2y = 11$ $y = 3x + 2$ ← is solved for y!

$$x + 2(3x + 2) = 11$$

$$x + 6x + 4 = 11$$

$$\begin{matrix} 7x + 4 = 11 \\ -4 \\ \hline 7x = 7 \\ \frac{7x}{7} = \frac{7}{7} \\ x = 1 \end{matrix}$$

$$y = 3(1) + 2$$

$$= 3 + 2$$

$$= 5$$

$$\begin{matrix} x & y \\ (1, & 5) \end{matrix}$$

to solve for x , no \div by #

$$\textcircled{4} \quad x - 2y = -6$$

$+2y$ $+2y$

$$x = 2y - 6$$

$$x = 2(2) - 6$$

$$\begin{pmatrix} x & y \\ -2 & 2 \end{pmatrix} = 4 - 6 = -2$$

to solve for $x \div 4$

to solve for $y \div 6$

$$4x + 6y = 4$$

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

$$8y - 24 + 6y = 4$$

$$14y - 24 = 4$$

$+24$ $+24$

$$\frac{14y}{14} = \frac{28}{14}$$

$$y = 2$$

Homework

$$\textcircled{3} \quad x = 17 - 4y \quad y = x - 2 \quad \textcircled{6} \quad 4x - 7y = 10 \quad y = x - 7$$

$$\textcircled{9} \quad 2x = 12 \quad x - 5y = -29 \quad \textcircled{12} \quad 2x + y = 9 \quad 4x - y = -15$$

$$\textcircled{15} \quad 11x - 7y = -14 \quad x - 2y = -4 \quad \textcircled{18} \quad \text{Which is a solution to}$$

$$4x - y = 17 \quad \& \quad -9x + 8y = 2$$

$\textcircled{a} (6, 7) \quad \textcircled{b} (7, 6) \quad \textcircled{c} (7, 11) \quad \textcircled{d} (11, 7)$