

SEC 4 TS
Systems of Equations Review
March 2017

Comparison Method

What to do?

EXAMPLES

a) $4x + y = 2$
 $x - y = 3$

$$y = -4x + 2$$

$$y = x - 3$$

$$-4x + 2 = x - 3$$

$$-5x = -5$$

$$x = 1$$

$$y = 1 - 3$$

$$y = -2$$

$$(1, -2)$$

c) $-7x + 2y = 18$
 $6x + 6y = 0$

$$y = \frac{7}{2}x + 9$$

$$y = -x$$

$$\frac{7}{2}x + 9 = -x$$

$$\frac{9}{2}x = -9$$

$$x = -2$$

$$y = 2$$

$$(-2, 2)$$

b) $x + 7y = 0$
 $2x - 8y = 22$

$$y = \frac{-x}{7}$$

$$y = \frac{1}{4}x - \frac{11}{4}$$

$$\frac{-x}{7} = \frac{1}{4}x - \frac{11}{4}$$

$$\frac{-11}{28}x = \frac{11}{4}$$

$$x = -7$$

$$y = 1$$

$$(-7, 1)$$

d) $4x - y = 20$
 $-2x - 2y = 10$

$$y = 4x - 20$$

$$y = -x - 5$$

$$4x - 20 = -x - 5$$

$$5x = 15$$

$$x = 3$$

$$y = -8$$

$$(3, -8)$$

SEC 4 TS
Systems of Equations Review
March 2017

Substitution Method

What to do?

EXAMPLES

a) $3x - 5y = 17$
 $y = -7$

$$3x - 5(-7) = 17$$

$$3x + 35 = 17$$

$$3x = -18$$

$$x = -6$$

$$y = -7$$

$$(-6, -7)$$

c) $7x + 2y = -19$
 $-x + 2y = 21$

$$x = 2y - 21$$

$$7(2y - 21) + 2y = -19$$

$$14y - 147 + 2y = -19$$

$$12y = 128$$

$$y = \frac{32}{3}$$

$$x = 2\left(\frac{32}{3}\right) - 21$$

$$x = \frac{1}{3}$$

$$\left(\frac{1}{3}, \frac{32}{3}\right)$$

b) $y = -5$
 $5x + 4y = -20$

$$5x + 4(-5) = -20$$

$$5x - 20 = -20$$

$$5x = 0$$

$$x = 0$$

$$y = -5$$

$$(0, -5)$$

d) $6x + 8y = -22$
 $y = -5$

$$6x + 8(-5) = -22$$

$$6x - 40 = -22$$

$$6x = 18$$

$$x = 3$$

$$y = -5$$

$$(3, -5)$$

SEC 4 TS
Systems of Equations Review
March 2017

Elimination Method

What to do?

EXAMPLES

$$\begin{array}{r} \text{a) } 8x - 6y = -20 \quad (-16) \\ \quad -16x + 7y = 30 \quad (8) \\ \hline -128x + 96y = 320 \\ -128x + 56y = 240 \\ \hline 40y = 80 \\ y = 2 \\ 8x - 12 = -20 \\ 8x = -8 \\ x = -1 \\ (-1, 2) \end{array}$$

$$\begin{array}{r} \text{c) } -16 + 20x - 8y = 0 \quad (-18) \\ \quad -18y - 22x = 36 \quad (-8) \\ \hline 288 - 360x + 144y = 0 \\ 144y + 176x = -288 \\ \hline 288 - 360x + 144y = 0 \\ 288 + 176x + 144y = 0 \\ \hline -536x = 0 \\ x = 0 \\ 288 + 176(0) + 144y = 0 \\ 144y = -288 \\ y = -2 \\ (0, -2) \end{array}$$

$$\begin{array}{r} \text{b) } -8x - 10y = 24 \quad (6) \\ \quad 6x + 5y = 2 \quad (-8) \\ \hline -48x - 60y = 144 \\ -48x - 40y = -16 \\ \hline -20y = 160 \\ y = -8 \\ 6x + 5(-8) = 2 \\ 6x - 40 = 2 \\ 6x = 42 \\ x = 7 \quad (7, -8) \end{array}$$

$$\begin{array}{r} \text{d) } -16y = 22 + 6x \quad (-11) \\ \quad -11y - 4x = 15 \quad (-16) \\ \hline -16y - 6x = 22 \\ -11y - 4x = 15 \\ \hline 176y + 66x = -242 \\ 176y + 64x = -240 \\ \hline 2x = -2 \\ x = -1 \\ -16y = 22 + 6(-1) \\ -16y = 16 \\ y = -1 \\ (-1, -1) \end{array}$$

SEC 4 TS
Systems of Equations Review
March 2017

PRACTICE WORD PROBLEMS

Two tables at a restaurant receive their bills shown below. How much more does an adult pay compared to a child? If a party of 12 adults and 18 children sat down, how much would the bill total?

<u>Table 1:</u> <u>6 adults</u> <u>4 kids</u> \$ 97
--

<u>Table 2:</u> <u>5 kids</u> <u>3 adults</u> \$ 65
--

$x = \text{adult}$
 $y = \text{Kid}$

Table 1

$$6x + 4y = 97$$

Table 2

$$3x + 5y = 65$$

$$6x + 4y = 97 \quad (3)$$

$$3x + 5y = 65 \quad (6)$$

$$\cancel{18x} + 12y = 291$$

$$\cancel{18x} + 30y = 390$$

$$-18y = -99$$

$$y = 5.50$$

$$6x + 4(5.50) = 97$$

$$6x = 75$$

$$x = 12.50$$

$$(12.50, 5.50)$$

$$12(12.5) + 18(5.50)$$

$$= 249 \$$$

Difference between adult and child is 7\$.