

Chapter 7 Review

1. A family recently moved to Calgary and each member registered at the library. It costs \$12 for an adult registration and \$6 for a child registration. The family registered 8 people and paid \$66.

a) Model this situation with a system of linear equations.

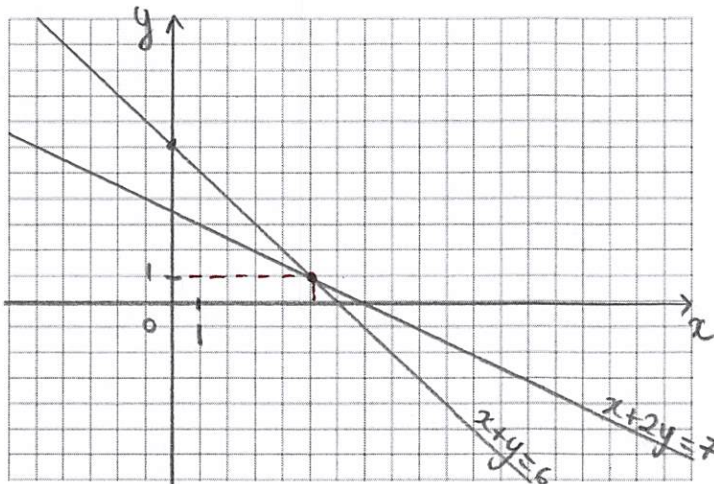
let x be the number of adults in the family
 y children

$$\begin{cases} x + y = 8 \\ 12x + 6y = 66 \end{cases}$$

b) Test to see if this family has 2 adults and 6 kids.

$\begin{array}{r l} x + y = 8 \\ 2 + 6 & 8 \\ \hline 8 & \checkmark \end{array}$	$\begin{array}{r l} 12x + 6y = 66 \\ 12 \times 2 + 6 \times 6 & 66 \\ \hline 24 + 36 & \\ 60 & \times \end{array}$	<u>No</u>
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2. Solve the following system by graphing: $\begin{cases} x + y = 6 & (1) \\ x + 2y = 7 & (2) \end{cases}$



solution: $\{(5, 1)\}$

(1) $y = -x + 6$
 slope -1 y -int: 6

(2) $2y = -x + 7$
 $y = -\frac{1}{2}x + \frac{7}{2}$
 slope: $-\frac{1}{2}$ y -int $\frac{7}{2}$

x	7
y	0

↑
not the best to use

3. Use graphing technology to find the solution to $\begin{cases} 3x + 4y = 5 & (1) \\ 5x - 2y = 4 & (2) \end{cases}$

(1) $y = -\frac{3}{4}x + \frac{5}{4}$

(2) $y = \frac{5}{2}x + 2$

solution: $\left\{ \left(-\frac{3}{13}, \frac{37}{26} \right) \right\}$

4. Solve the following system by substitution: $\begin{cases} 2x - 3y = -2 & (1) \\ 4x + y = 24 & (2) \end{cases}$

$$(2) \quad y = -4x + 24$$

$$(1) \quad 2x - 3(-4x + 24) = -2$$

$$2x + 12x - 72 = -2$$

$$14x = 70$$

$$x = 5$$

$$\text{solution: } \{(5, 4)\}$$

$$(2) \quad y = -4(5) + 24$$

$$y = 4$$

5. Solve the following system by elimination: $\begin{cases} 2x - y = 9 & \times 3 & \times 4 \\ 3x + 4y = -14 & \times (-2) & \times 4 \end{cases}$

$$\begin{array}{r} 6x - 3y = 27 \\ -6x - 8y = 28 \\ \hline \end{array}$$

$$-11y = 55$$

$$y = -5$$

$$\begin{array}{r} 8x - 4y = 36 \\ 3x + 4y = -14 \\ \hline \end{array}$$

$$11x = 22$$

$$x = 2$$

$$\text{solution: } \{(2, -5)\}$$

6. Find the number of solutions of each system without solving them.

a) $\begin{cases} -x + y = 8 & (1) \\ 2x - 2y = -16 & (2) \end{cases}$

$$(1) \quad y = x + 8$$

$$(2) \quad -2y = -2x - 16$$

$$y = x + 8$$

same slope & same y-intercept \Rightarrow infinity of solutions

b) $\begin{cases} 4x + y = 2 & (1) \\ 8x + 2y = 8 & (2) \end{cases}$

$$(1) \quad y = -4x + 2$$

$$(2) \quad 2y = -8x + 8$$

$$y = -4x + 4$$

same slope & y-int different \Rightarrow no solution