Math 10
Chapter 7 Review

Name: Key
Block:_____

1. Create a linear system to model each of the following situations. Do not solve.

   a) The smaller of two numbers is 3 less than the larger number. The sum of the numbers is 45.

   S L

   $S = L - 3$ $S + L = 45$

   b) The perimeter of a rectangle is 120 cm. The length is double the width.

   l

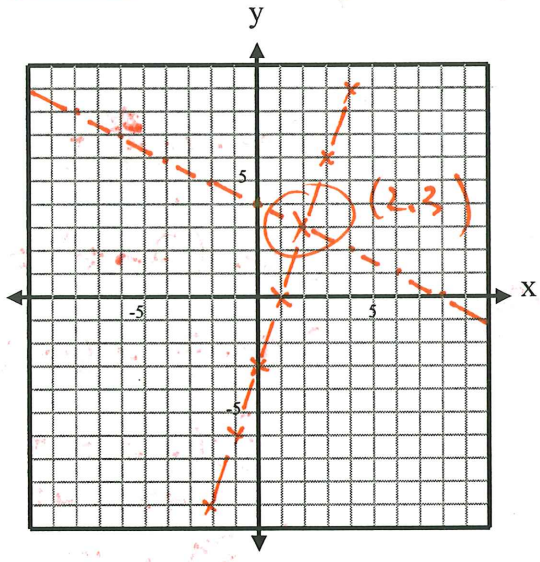
   w

   l = length
   w = width

   $2l + 2w = 120$
   $l = 2w$

2. Solve each of the following systems by graphing:

   a) $y = -\frac{1}{2}x + 4$
   $y = 3x - 3$



Solution: (2, 3)

   b) $x + 2y = -4$
   $4y - 3x = 12$

$x + 2y = -4$
$-x \quad -x$

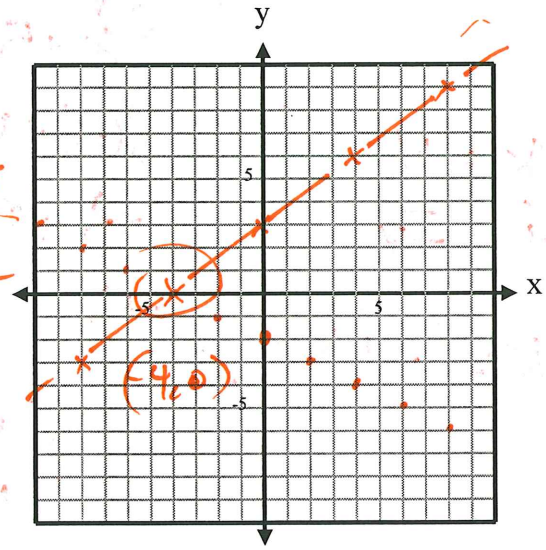
$\frac{2y}{2} = \frac{-x}{2} - \frac{4}{2}$

$y = -\frac{1}{2}x - 2$

$4y - 3x = 12$
$+3x \quad +3x$

$\frac{4y}{4} = \frac{3x}{4} + \frac{12}{4}$

$y = \frac{3}{4}x + 3$



Solution: (-4, 0)

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3. Solve each of the following systems of equations by substitution.

a) $y = 3 - 3x$
$2x + 3y = -5$

$2x + 3(3 - 3x) = -5$

$2x + 9 - 9x = -5$

$9 - 7x = -5$
$-9 \quad -9$

$\frac{-7x}{-7} = \frac{-14}{-7}$

$\boxed{x = 2}$

$y = 3 - 3x$
$= 3 - 3(2)$
$= 3 - 6$
$\boxed{y = -3}$

$(2, -3)$

b) $x + y = 7$
$2x - y = 5$

$x + y = 7$
$-x \quad -x$
$y = 7 - x$

$2x - y = 5$

$2x - (7 - x) = 5$

$2x - 7 + x = 5$

$3x - 7 = 5$
$+7 \quad +7$

$\frac{3x}{3} = \frac{12}{3}$

$\boxed{x = 4}$

$y = 7 - x$
$= 7 - 4$
$\boxed{y = 3}$

$(4, 3)$

4. Solve each of the following systems of equations by elimination.

a) $3x + 5y = 12$
$7x + 5y = 8$

$(-)$

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

$x = -1$

$3x + 5y = 12$

$3(-1) + 5y = 12$

$-3 + 5y = 12$
$+3 \quad +3$

$\frac{5y}{5} = \frac{15}{5}$

$y = 3$

$(-1, 3)$

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b) $2x + 8y = 8$
$-2x + y = 10$

$+$

$\frac{9y}{9} = \frac{9}{9}$

$y = 2$

$2x + 8y = 8$
$2x + 8(2) = 8$
$2x + 16 = 8$
$-16 \quad -16$
$\frac{2x}{2} = \frac{-8}{2}$
$\boxed{x = -4}$

$(-4, 2)$

c) $2(5x + 2y = 5)$
$3x - 4y = -23$

$\rightarrow 10x + 4y = 10$
$3x - 4y = -23$

$\frac{13x}{13} = \frac{-13}{13}$
$\boxed{x = -1}$

$3x - 4y = -23$
$3(-1) - 4y = -23$
$-3 - 4y = -23$
$+3 \quad +3$
$\frac{-4y}{-4} = \frac{-20}{-4}$
$\boxed{y = 5}$

$(-1, 5)$

d) $4(5x + 8y = -2)$
$5(4x + 6y = -2)$

$\rightarrow 20x + 32y = -8$
$\rightarrow 20x + 30y = -10$
$-$

$\frac{2y}{2} = \frac{2}{2}$
$y = 1$

$5x + 8y = -2$
$5x + 8(1) = -2$
$5x + 8 = -2$
$-8 \quad -8$
$\frac{5x}{5} = \frac{-10}{5}$
$x = -2$

$(-2, 1)$

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5. Determine the number of solutions to each of the following systems of equations.

a) $2(2x + y = 5)$
$4x + 2y = 6$

$4x + 2y = 10$
$\ominus\ 4x + 2y = 6$
$0 = 4$

$2x + y = 5$
$-2x \quad -2x$
$y = -2x + 5$

$4x + 2y = 6$
$-4x \quad -4x$
$\frac{2y}{2} = \frac{-4x}{2} + \frac{6}{2}$
$y = -2x + 3$

none

b/c same slope & diff. y-int

b) $4(x + y = 3)$
$4x + 4y = 12$

$\rightarrow 4x + 4y = 12$
$\ominus\ 4x + 4y = 12$
$0 = 0$

Same equation ∴ Same slope & y-int

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

$4x + 4y = 12$
$-4x \quad -4x$
$\frac{4y}{4} = \frac{-4x}{4} + \frac{12}{4}$
$y = -x + 3$

infinite

c) $2x + y = 10$
$3(x + y = 3)$

$2x + y = 10$
$\ominus\ 2x + 2y = 6$
$-y = 4$
$y = -4$

$2x + y = 10$
$-2x \quad -2x$
$y = -2x + 10$

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

different slopes

one

6. Given the equation y=-3x + 1, write a second equation to form a system with

a) no solution $y = -3x + 2$

b) infinitely many solutions $y = -3x + 1$

$2y = -6x + 2$
$3y = -9x + 3$

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