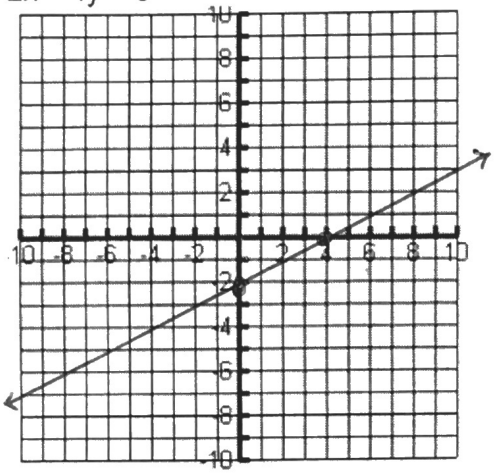
Name Key Class _____ Date _____

1-2 Homework

Systems of Equations with Context

Solve by Graphing.

$3x - 6y = 12$
$2x - 4y = 8$



same line, so

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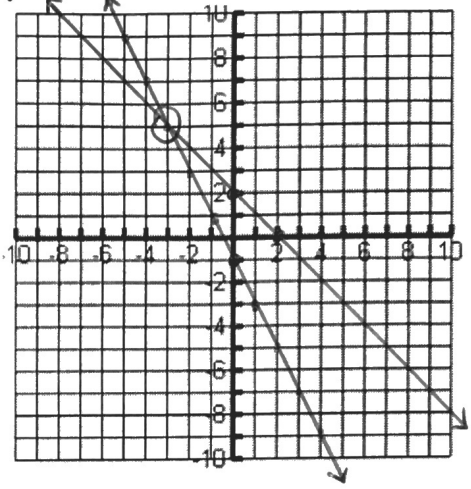
$x + y = 2$
$y = -2x - 1$



$(-3, 5)$

Solve by Substitution.

$2x - 3y = -1$
$y = x - 1$

$(4, 3)$

$2x - 3(x-1) = -1$
$2x - 3x + 3 = -1$
$-x = -4$
$x = 4$ → $y = 4 - 1$
$y = 3$

$y = -3x + 5$
$5x - 4y = -3$

$(1, 2)$

$5x - 4(-3x+5) = -3$
$5x + 12x - 20 = -3$
$17x = 17$
$x = 1$ → $y = -3(1) + 5$
$y = 2$

Solve by Elimination.

$(5x + y = 9) \cdot -2$ → $-10x - 2y = -18$
$10x - 7y = -18$

$-10x - 2y = -18$
$10x - 7y = -18$
$-9y = -36$
$y = 4$ → $5x + 4 = 9$
$5x = 5$
$x = 1$

$(1, 4)$

$(-3x + 7y = -16)(-3)$ → $9x - 21y = 48$
$-9x + 5y = 16$

$9x - 21y = 48$
$-9x + 5y = 16$
$-16y = 64$
$y = -4$ → $-3x + 7(-4) = -16$
$-3x - 28 = -16$
$x = -4$

$(-4, -4)$

For each question, define your variables, write a system of equations, and solve using any method. Please use a separate sheet of paper to show all work.

1. The length of a rectangle is 3 cm more than twice the width. The perimeter of the rectangle is 42 cm. Find the dimensions of the rectangle.

$l = 3 + 2w$

$2l + 2w = 42$

substitution:

$2(3+2w) + 2w = 42$

$6 + 4w + 2w = 42$

$6w = 36$

$w = 6$

$l = 3 + 2(6)$

$l = 15$

2. Suppose you have \$200 in your account and you save \$10 dollars each week. Your friend has \$110 in their account and starts saving \$15 each week. When will your account balances be the same?

$A = 200 + 10w$

$A = 110 + 15w$

substitution:

$200 + 10w = 110 + 15w$

$90 = 5w \longrightarrow w = 18$

3. The difference of two numbers is 40. Their sum is 66. Find the numbers.

$a - b = 40$

$a + b = 66$

elimination: $a - b = 40$, $a + b = 66$

$2a = 106$

$a = 53$

$53 + b = 66$

$b = 13$

4. A youth group and their leaders visited Mammoth Cave. Two adults and 5 students in one van paid \$77. Two adults and 7 students in another van paid \$95. Find the adult price and student price of the tour.

$2a + 5s = 77$

$2a + 7s = 95$

elimination: $2a + 5s = 77$, $-2a - 7s = -95$

$-2s = -18$

$s = 9$

$2a + 5(9) = 77$

$2a + 45 = 77$

$a = 16$

5. A winter clothing store had a sale and Cory bought two pairs of gloves and four hats for \$43. Mark bought two pairs of gloves and two hats for \$30. How much did each pair of gloves and each hat cost?

$2g + 4h = 43$

$2g + 2h = 30$

elimination: $2g + 4h = 43$, $-2g - 2h = -30$

$2h = 13$

$h = 6.5$

$2g + 2(6.5) = 30$

$g = 8.5$

6. At a recreation and sports facility, 3 members and 3 nonmembers pay a total of \$180 to take a yoga class. A group of 5 members and 3 nonmembers pay \$210 to take the same class. How much does it cost each member and nonmember to take the yoga class?

$3m + 3n = 180$

$5m + 3n = 210$

elimination: $3m + 3n = 180$, $-5m - 3n = -210$

$-2m = -30$

$m = 15$

$3(15) + 3n = 180$

$n = 45$

7. Joey has \$5.75 made up of all dimes and quarters. If Joey has 38 coins, how many of each coin does he have?

$.1d + .25q = 5.75$

$d + q = 38$

$d = 38 - q$

substitution: $.1(38-q) + .25q = 5.75$

$3.8 - .1q + .25q = 5.75$

$.15q = 1.95$

$q = 13$

$d = 38 - 13$

$d = 25$