Math 10D Name_____

Lesson: Solving Linear Systems - Word Problems and Some Fun.

1) The school that Shawna goes to is selling tickets to the annual talent show. On the first day of ticket sales the school sold 27 adult tickets and 26 student tickets for a total of $579. The school took in $412 on the second day by selling 46 adult tickets and 6 student tickets. Find the price of an adult ticket and the price of a student ticket.

x y

First Day: $27x + 26y = 579$

Second Day: $46x + 6y = 412$

$1242x + 1196y = 26634$

$-(1242x + 162y = 11124)$

$1034y = 15510$

$\rightarrow y = \$15$

$27x + 26(15) = 579$

$27x + 390 = 579$

$27x = 189$

$x = \$7$

∴ the student ticket is $15 and the adult is $7

2) Maria's Premium Coffee Blend which costs $7/lb is made by combining arabica coffee beans which cost $12/lb with robusta coffee beans which cost $6/lb. Find the number of lb of arabica coffee beans and robusta coffee beans required to make 6 lb of Maria's Premium Coffee Blend.

weight

Let x = pounds of arabica y = pounds of robusta

Weight: $x + y = 6$

Cost: $\$12x + \$6y = \$7(6)$

$12x + 12y = 72$

$-(12x + 6y = 42)$

$6y = 30$

$\rightarrow y = 5$ pounds

$x + 5 = 6$

$x = 1$ pound

∴ Maria's Premium Blend has one pound of arabica and five pounds of robusta

3) Mark wants to make 15 ml of a 26% saline solution by mixing together a 20% saline solution and a 50% saline solution. How much of each solution must he use?

y x

Volume: $x + y = 15 \Rightarrow x = 15 - y$

%: $20x + 50y = 26(15)$

$20(15 - y) + 50y = 390$

$300 - 20y + 50y = 390$

$300 + 30y = 390$

$30y = 90$

$y = 3$

$x = 15 - 3$

$x = 12$

∴ Mark needs 12 ml of the 50% solution and 3 ml of the 20% solution

Solve the system by substitution.

4) $-7a + 3c = -54$
$10a + 12b + 7c = 37$
$7a + 5b + 6c = -10$