Algebra 2

Name __*Key*__   ID: 1

Solving Systems Word Problems

Date _____ Period ____ _____

1) The local amusement park is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 5 vans and 3 buses with 90 students. High School B rented and filled 14 vans and 3 buses with 144 students. Each van and each bus carried the same number of students. Find the number of students in each van and in each bus.

$V = vans$
$b = buses$

$$\begin{cases} 5v + 3b = 90 \\ 14v + 3b = 144 \cdot -1 \end{cases}$$

$-14v - 3b = -144$
_____
$-9v + 0 = -54$

$-9v = -54$
$\boxed{v = 6}$

plug: $5(6) + 3b = 90$
$30 + 3b = 90$
$3b = 60$
$\boxed{b = 20}$

2) The senior classes at High School A and High School B planned separate trips to New York City. The senior class at High School A rented and filled 5 vans and 10 buses with 570 students. High School B rented and filled 5 vans and 1 bus with 111 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?

$V = vans$
$b = buses$

$$\begin{cases} 5v + 10b = 570 \\ 5v + b = 111 \cdot -1 \end{cases}$$

$-5v - b = -111$
_____
$0 + 9b = 459$

$9b = 459$
$\boxed{b = 51}$

plug: $5v + 51 = 111$
$5v = 60$
$\boxed{v = 12}$

3) Jenny and Adam are selling wrapping paper for a school fundraiser. Customers can buy rolls of plain wrapping paper and rolls of shiny wrapping paper. Jenny sold 11 rolls of plain wrapping paper and 11 rolls of shiny wrapping paper for a total of $209. Adam sold 1 roll of plain wrapping paper and 11 rolls of shiny wrapping paper for a total of $119. Find the cost each of one roll of plain wrapping paper and one roll of shiny wrapping paper.

$P = plain \; paper$
$S = shiny \; paper$

$$\begin{cases} 11p + 11s = 209 \\ p + 11s = 119 \cdot -1 \end{cases}$$

$-p - 11s = -119$
_____
$10p + 0 = 90$

$10p = 90$
$\boxed{P = 9}$

plug: $9 + 11s = 1$
$11s = 110$
$\boxed{S = 10}$

4) Maria's school is selling tickets to the annual talent show. On the first day of ticket sales the school sold 7 adult tickets and 12 child tickets for a total of $148. The school took in $98 on the second day by selling 7 adult tickets and 7 child tickets. What is the price each of one adult ticket and one child ticket?

$A = adult \; tix$
$C = child \; tix$

$$\begin{cases} 7A + 12C = 148 \\ 7A + 7C = 98 \cdot -1 \end{cases}$$

$-7A - 7C = -98$
_____
$0 + 5C = 50$

$5C = 50$
$\boxed{C = 10}$

plug: $7A + 7(10) = 98$
$7A + 70 = 98$
$7A = 28$
$\boxed{A = 4}$

5) The school that Lea goes to is selling tickets to the annual dance competition. On the first day of ticket sales the school sold 4 senior citizen tickets and 3 student tickets for a total of $65. The school took in $212 on the second day by selling 10 senior citizen tickets and 12 student tickets. Find the price of a senior citizen ticket and the price of a student ticket.

$S = senior \; citizen \; tix$
$T = student \; tix$

$$\begin{cases} 4S + 3T = 65 \cdot -4 \\ 10S + 12T = 212 \end{cases}$$

$-16S - 12T = -260$
_____
$-6S + 0 = -48$

$-6S = -48$
$\boxed{S = 8}$

plug: $4(8) + 3T = 65$
$32 + 3T = 65$
$3T = 33$
$\boxed{T = 11}$

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