Algebra 1 (Acad.) Name KEY

7WP - Word Problems with Systems

Date _____ Period ____

1) The school that Elisa goes to is selling tickets to a choral performance. On the first day of ticket sales the school sold 3 senior citizen tickets and 22 student tickets for a total of $172. The school took in $194 on the second day by selling 2 senior citizen tickets and 26 student tickets. Find the price of a senior citizen ticket and the price of a student ticket.

Key Information: 1ST DAY - 3 senior + 22 student tickets for $172
2ND DAY - 2 " 26 " " $194

Variables: X= senior tickets $'s
Y= student tickets $'s

Equations: 1) DAY 1 - $(3X + 22Y = 172)\ x2$ ✓
2) DAY 2 - $(2X + 26Y = 194)\ x-3$ ✓

Solve and Check:

$6X + 44Y = 344$
$-6X - 78Y = -582$ +

$-34Y = -238$

$\frac{-34Y}{-34} = \frac{-238}{-34}$

$Y = 7$

FIND X

$3X + 22(7) = 172$
$3X + 154 = 172$
$-154 \quad -154$
$\frac{3X}{3} = \frac{18}{3}$

$X = 6$

Answer (in words)

senior citizen ticket: $6, student ticket: $7

2) The county fair 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 88 vans and 3 buses with 1255 students. High School B rented and filled 22 vans and 100 buses with 3986 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?

Key Information: HS A: 88 vans - 3 buses - 1,255 students
HS B: 22 vans - 100 buses - 3,986 students

Variables: X= # students in a van
Y= # students in a bus

Equations: 1) HS A: $88X + 3Y = 1255$ ✓
2) HS B: $(22X + 100Y = 3986)\ x-4$ ✓

Remember-Use Calc to Check!!

Solve and Check:

$88X + 3Y = 1255$
$-88X - 400Y = -15944$ +

$-397Y = -14,689$

$\frac{-397Y}{-397} = \frac{-14,689}{-397}$

$Y = 37$

FIND X

$88X + 3(37) = 1255$
$88X + 111 = 1255$
$-111 \quad -111$

$\frac{88X}{88} = \frac{1144}{88}$

$X = 13$

Answer (in words) Van hold 13 students and the Bus hold 37 students

3) The school that Lea goes to is selling tickets to the annual talent show. On the first day of ticket sales the school sold 64 adult tickets and 5 child tickets for a total of $926. The school took in $784 on the second day by selling 23 adult tickets and 77 child tickets. Find the price of an adult ticket and the price of a child ticket.

Key Information: 1ST DAY Sold 64 adult + 5 Kid tickets for $926
2ND DAY sold 23 " + 77 " " for $784

Variables: X= adult ticket $'s
Y= child ticket $'s

Equations: 1) DAY1: $(64x + 5y = 926) \times 23$
2) DAY2: $(23x + 77y = 784) \times -64$

Solve and Check:

$1472x + 115y = 21,298$
$-1472x - 4928y = -50,176$
$-4813y = -28,878$
$\frac{-4813}{-4813} = \frac{-28,878}{-4813}$
$y = 6$

FIND X
$64x + 5(6) = 926$
$64x + 30 = 926$
$-30 \quad -30$
$\frac{64x}{64} = \frac{896}{64}$
$x = 14$

Answer (in words)
adult ticket: $14, child ticket: $6

4) Amy and James are selling cheesecakes for a school fundraiser. Customers can buy New York style cheesecakes and chocolate marble cheesecakes. Amy sold 9 New York style cheesecakes and 39 chocolate marble cheesecakes for a total of $597. James sold 25 New York style cheesecakes and 39 chocolate marble cheesecakes for a total of $757. Find the cost each of one New York style cheesecake and one chocolate marble cheesecake.

Key Information: Amy sold 9 NY - 39 chocolate - $597
James " 25 " 39 chocolate - $757

Variables: X= NY cheesecake $'s
Y= Chocolate cheesecake $'s

Equations: 1) Amy: $9x + 39y = 597$
2) James: $(25x + 39y = 757) \times -1$

Solve and Check:

$9x + 39y = 597$
$-25x - 39y = -757$
$-16x = -160$
$\frac{-16x}{-16} = \frac{-160}{-16}$
$x = 10$

FIND Y
$9(10) + 39y = 597$
$90 + 39y = 597$
-90
$39y = 507$
$\frac{39y}{39} = \frac{507}{39}$
$y = 13$

Answer (in words)
New York style cheesecake: $10, chocolate marble cheesecake: $13

5) Beth and Brenda are selling pies for a school fundraiser. Customers can buy apple pies and Maine blueberry pies. Beth sold 14 apple pies and 9 blueberry pies for a total of $376.20. Brenda sold 7 apple pies and 14 blueberry pies for a total of $372.40. Find the cost each of one apple pie and oneMaine blueberry pie.

Key Information: Beth - 14 apple - 9 blueberry - $376.20
Brenda - 7 " - 14 " - $372.40

Variables: X= an apple pie $'s
Y= a Maine blueberry pie $'s

Equations: 1) Beth $14x + 9y = 376.20$ ✓
2) Brenda $(7x + 14y = 372.40) \times -2$ ✓

Solve and Check:

$14x + 9y = 376.20$
$-14x - 28y = -744.80$
$-19y = -368.60$
$-19 \quad -19$
$y = 19.4$

FIND X

$14x + 9(19.4) = 376.20$
$14x + 174.6 = 376.20$
$-174.6 \quad -174.6$
$14x = 201.6$
$14 \quad 14$
$x = 14.4$

Answer (in words)
apple pie: $14.40, Maine blueberry pie: $19.40

6) Shawna and Ted each improved their yards by planting rose bushes and ornamental grass. They bought their supplies from the same store. Shawna spent $102.20 on 14 rose bushes and 6 bunches of ornamental grass. Ted spent $80.50 on 7 rose bushes and 9 bunches of ornamental grass. Find the cost of one rose bush and the cost of one bunch of ornamental grass.

Key Information: Shawna – 14 rose bushes - 6 Grass – $102.20
Ted – 7 " " 9 " – $80.50

Variables: X= a rose bush $'s
Y= ornamental grass bunch $'s

Equations: 1) Shawna: $14x + 6y = 102.20$ ✓
2) Ted: $(7x + 9y = 80.50) \times -2$ ✓

Solve and Check:

$14x + 6y = 102.20$
$-14x - 18y = -161.00$ (+)

$-12y = -58.8$

$\frac{-12y}{-12} = \frac{-58.8}{-12}$

$y = 4.9$

Find x

$14x + 6(4.9) = 102.20$

$14x + 29.4 = 102.20$

$-29.4 \quad -29.40$

$14x = 72.8$

$\frac{14x}{14} = \frac{72.8}{14}$

$x = 5.20$

Answer (in words)
rose bush: $5.20, bunch of ornamental grass: $4.90