***AAT (IC/HW)-Day 1**

Chapter 9: 9-2 Systems of Linear Equations in 2 Variables

Name Key

Date: _____ Period: _____

Use elimination to solve the system.

1. $\begin{cases} 2x + 3y = 2 \\ x - 2y = 8 \end{cases}$ -2

$2x + 3y = 2$

$+ \quad -2x + 4y = -16$

$7y = -14$

$y = -2$

$x = 4$

$(4, -2)$

2. $\begin{cases} 2x + 5y = 16 \\ 3x - 7y = 24 \end{cases}$ 3 -2

$6x + 15y = 48$

$+ \quad -6x + 14y = -48$

$29y = 0$

$y = 0$

$x = 8$

$(8, 0)$

3. $\begin{cases} 3r + 4s = 3 \\ r - 2s = -4 \end{cases}$ 2

$3r + 4s = 3$

$+ \quad 2r - 4s = -8$

$5r = -5$

$r = -1$

$s = 3/2$

$(-1, 3/2)$

4. $\begin{cases} 5x - 6y = 4 \\ 3x + 7y = 8 \end{cases}$ 3 -5

$15x - 18y = 12$

$-15x - 35y = -40$

$\frac{-53y}{-53} = \frac{-28}{-53}$

$y = \frac{28}{53}$

$x = \frac{76}{53}$

$\left(\frac{76}{53}, \frac{28}{53}\right)$

5. $\begin{cases} \frac{1}{3}c + \frac{1}{2}d = 5 \\ c - \frac{2}{3}d = -1 \end{cases}$ 6 3

$2(2c + 3d = 30)$

$3(3c - 2d = -3)$

$4c + 6d = 60$

$+ \quad 9c - 6d = -9$

$13c = 51$

$c = \frac{51}{13}$

$d = \frac{96}{13}$

$\left(\frac{51}{13}, \frac{96}{13}\right)$

Solve x Solve y

6. $\begin{cases} \sqrt{3}x - \sqrt{2}y = 2\sqrt{3} \\ 2\sqrt{2}x + \sqrt{3}y = \sqrt{2} \end{cases}$ $\sqrt{3}$ $\sqrt{2}$ $2\sqrt{2}$ $-\sqrt{3}$

$3x - \sqrt{6}y = 6$

$+ \quad 4x + \sqrt{6}y = 2$

$7x = 8$

$x = \frac{8}{7}$

$2\sqrt{6}x - 4y = 4\sqrt{6}$

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

$\frac{-7y}{-7} = \frac{3\sqrt{6}}{-7}$

$y = \frac{-3\sqrt{6}}{7}$

$\left(\frac{8}{7}, \frac{-3\sqrt{6}}{7}\right)$

7. $\begin{cases} 2x - 3y = 5 \\ -6x + 9y = 12 \end{cases}$ $\times 3$

$6x - 9y = 15$
$+ \quad -6x + 9y = 12$

$0 \neq 27$

$\emptyset$

8. $\begin{cases} 3m - 4n = 2 \\ -6m + 8n = -4 \end{cases}$ $\times 2$

$6m - 8n = 4$
$+ \quad -6m + 8n = -4$

$0 = 0$

All R's

9. $\begin{cases} \frac{2}{x} + \frac{3}{y} = -2 \\ \frac{4}{x} - \frac{5}{y} = 1 \end{cases}$

let $u = \frac{1}{x}$
let $v = \frac{1}{y}$

$(2u + 3v = -2)\ -2$
$4u - 5v = 1$

$-4u - 6v = 4$
$+ \quad 4u - 5v = 1$

$-11v = 5$

$v = \frac{-5}{11}$; $\frac{-5}{11} = \frac{1}{y}$

$-5y = 11$
$y = \frac{-11}{5}$

$u = \frac{-7}{22}$

$\frac{-7}{22} = \frac{1}{x}$

$-7x = 22$
$x = \frac{-22}{7}$

$\left(\frac{-22}{7}, \frac{-11}{5}\right)$

10. The price admission to a high school play was \$3.00 for students and \$4.50 for nonstudents. If 450 tickets were sold for a total of \$1555.50, how many of each kind were purchased?

x = \$3.00 tickets
y = \$4.50 tickets

$-3(x + y = 450)$ (quantity)
$3x + 4.5y = 1555.50$ (value)

$-3x - 3y = -1350$
$+ \quad 3x + 4.5y = 1555.5$

$1.5y = 205.5$
$y = 137$
$x = 313$

(313, 137)
\$3/ticket \$4.50/ticket

11. An airline that flies from Los Angeles to Albuquerque with a stopover in Phoenix charges a fare of \$45 to Phoenix and a fare of \$60 from Los Angeles to Albuquerque. A total of 185 passengers boarded the plane in Los Angeles, and fares totaled \$10,500. How many passengers got off the plane in Phoenix?

x = # people to Phoenix
y = # people to Albuquerque

$-45(x + y = 185)$ (quantity)
$45x + 60y = 10,500$ (value)

$-45x - 45y = -8325$
$+ \quad 45x + 60y = 10,500$

$15y = 2175$
$y = 145$; $x = 40$

(40, 145)
to Phoenix to Albuquerque

12. A man rows a boat 500 feet upstream against a constant current in 10 minutes. He then rows 300 feet downstream (with the same current) in 5 minutes. Find the speed of the current and the equivalent rate at which he can row in still water.

x = rate in still H_2O
y = speed of current

$D = r \cdot t$

$500 = (x-y)10$ (upstream)

$300 = (x+y)5$ (downstream)

$50 = x - y$

$+ \quad 60 = x + y$

$110 = 2x$

$55 = x$

$5 = y$

(55 ft/min, 5 ft/min)

13. A merchant wishes to mix peanuts costing \$3 per pound with cashews costing \$8 per pound to obtain 60 pounds of a mixture costing \$5 per pound. How many pounds of each variety should be mixed?

x = # of lbs of peanuts
y = # of lbs of cashews

$3(x + y = 60)$ (quantity)

$3x + 8y = 5(60)$ (value)

(36 peanuts, 24 cashews)

$-3x + 3y = 180$

$3x + 8y = 300$

$-5y = -120$

$y = 24$

$x = 36$

14. A silversmith has two alloys, one containing 35% silver and the other 60% silver. How much of each should be melted and combined to obtain 100 grams of an alloy containing 50% silver?

x = # of grams of 35%
y = # of grams of 60%

$35(x + y = 100)$ (quantity)

$.35x + .60y = .5(100)$ (value)

$35x + 60y = 5000$

$-\ 35x + 35y = 3500$

$25y = 1500$

$y = 60$

$x = 40$

(40g, 60g)
35% 60%