Assignment 6.4_1	**Period (circle one):** 5 7	**Date:** 2/2/15	**Name:** Key

Write a system of equations to represent each problem situation. Solve the system of equations using any method and answer any associated questions.

Stella is trying to choose between two rental car companies. Speedy Trip Rental Cars charges a base fee of $24 plus an additional fee of $0.05 per mile. Wheels Deals Rental Cars charges a base fee of $30 plus an additional fee of $0.03 per mile. Determine the amount of miles driven for which both rental car companies charge the same amount. Explain which company Stella should use based on the number of miles she expects to drive.

Speedy Trip : Total cost = 24 + 0.05 × number of miles
Wheels Deals: Total cost = 30 + 0.03 × number of miles

$$\begin{cases} y = 24 + 0.05x \\ y = 30 + 0.03x \end{cases}$$

$24 + 0.05x = 30 + 0.03x$
$-0.03x \quad -0.03x$
$24 + 0.02x = 30$
$-24 \quad -24$
$0.02x = 6$
$\frac{0.02x}{0.02} = \frac{6}{0.02}$
$x = 300$

$y = 24 + 0.05x$
$y = 24 + 0.05(300)$
$y = 24 + 15$
$y = 39$

(300, 39)

If Stella drives exactly 300 miles, then both companies will charge her the same amount, $39. However, if she intends to drive more than 300 miles, then she should use Wheels Deals with the lower cost per mile. If she intends on driving less than 300 miles, she should use Speedy Trip with the lower rental fee.

Solve each system of linear equations. **Use the back for additional writing space!**

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

$7 \cdot (3x - y = 5) \cdot 7$
$21x - 7y = 35$
$+ \quad 2x + 7y = -12$
$23x = 23$
$\frac{23x}{23} = \frac{23}{23}$
$x = 1$

* want to make the y's opposites
* add the equations and solve for x

$3x - y = 5$
$3(1) - y = 5$
$3 - y = 5$
$-3 \quad -3$
$-y = 2$
$\frac{-y}{-1} = \frac{2}{-1}$
$y = -2$

* Substitute to find the value of y

(1, -2)

* Don't forget to write your final answer like an ordered pair (x, y)

$$\begin{cases} 8y = 6 - 9x \\ y + 5 = -4x \end{cases}$$

$\frac{8y}{8} = \frac{6}{8} - \frac{9x}{8}$
$y = \frac{6}{8} - \frac{9}{8}x$

$y + 5 = -4x$
$-5 \quad -5$
$y = -4x - 5$

$\frac{6}{8} - \frac{9}{8}x = -4x - 5$

$8 \cdot (\frac{6}{8} - \frac{9}{8}x) = (-4x - 5) \cdot 8$
$6 - 9x = -32x - 40$
$+32x \quad +32x$
$6 + 23x = -40$
$-6 \quad -6$
$\frac{23x}{23} = \frac{-46}{23}$
$x = -2$

* wanted to get y's by themselves so I could set the two parts of the equations equal and solve.

$y = -4x - 5$
$y = -4(-2) - 5$
$y = 8 - 5$
$y = 3$

(-2, 3)