

1. The Turbo Taxi Service charges a flat rate of \$5 and then \$0.40 per mile. The Express Taxi Company charges a flat rate of \$2 and then \$0.75 per mile.

- a. Write an equation that describes the cost, c , of each taxi cab in terms of miles, m , driven.

Turbo Taxi Service: $c = 5 + 0.40m$

Express Taxi Co: $c = 2 + 0.75m$



- b. When do the two taxi cabs charge the same amount?

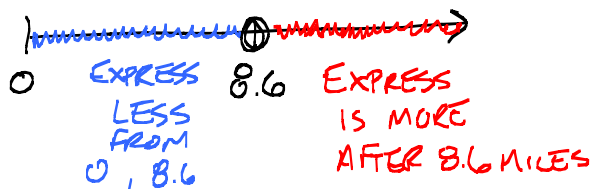
$$\begin{array}{r} 5 + 0.4m = 2 + 0.75m \\ -0.40m \quad -0.40m \\ \hline 5 = 2 + 0.35m \\ -2 \quad -2 \\ \hline 3 = 0.35m \end{array}$$

$$\frac{3}{0.35} = \frac{0.35m}{0.35} \quad | 3 \div .35$$

$$8.571428571$$

$$8.6 \approx m$$

- c. Describe when the Express Taxi Company charges more than Turbo Taxi Services.



$$m > 8.6$$

2. Theresa was taking her 2 grandchildren to the zoo. Theresa purchased 1 adult ticket for herself and 2 children's tickets for \$18.20. A family of 5 were also visiting the zoo. The family purchased 2 adult and 3 children's tickets for \$30.90.

- a. Write an equation that describes each purchase:

Theresa: $1a + 2c = 18.20$

Family: $2a + 3c = 30.90$



- b. Solve the system to determine how much an adult's ticket costs for the zoo.

$$\begin{array}{r} 2 \cdot 1a + 2c = 18.20 \cdot 3 \\ -1 \cdot 2a + 3c = 30.90 \cdot -2 \\ \hline \end{array}$$

$$\begin{array}{r} 2a + 4c = 36.40 \\ -2a - 3c = -30.90 \\ \hline 1c = 5.50 \end{array}$$

$$\begin{array}{r} 3a + 6c = 54.60 \\ + -4a - 6c = -66.80 \\ \hline -1a = -12.20 \\ \hline a = 12.20 \end{array}$$

$$a = 7.20$$

3. A sales person that worked at a cell phone store recorded the following information about the number of Android phones and iPhones that he sold for the day:
- He sold a total of 24 smartphones that were either an iPhone or an Android phone.
 - The iPhones that he sold were all priced at \$200 and the all of the Android phones were priced at \$150. He sold a total of value of \$4150 in smartphones.
- a. Write an equation that describes each piece of information. Let '**P**' represent the number of iPhones and '**A**' represent the number of Android Phones.

Total Number: $P + A = 24$

Total Sales: $200P + 150A = 4150$



- b. Using the system of equations determine the number of each type of phone that was sold.

$$\begin{array}{rcl}
 200 \cdot & \boxed{P + A = 24} & \cdot 150 \\
 -1 \cdot & \boxed{200P + 150A = 4150} & \cdot -1 \\
 \hline
 \cancel{200P} + \cancel{200A} = 4800 & & 150P + 150A = 3600 \\
 -\cancel{200P} - 150A = -4150 & & + -200P - 150A = -4150 \\
 \hline
 50A = 650 & \boxed{A = 13} & \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 & & 150P + 150A = 3600 \\
 & & + -200P - 150A = -4150 \\
 \hline
 -50P & & = -550 \\
 \hline
 -50 & & -50 \\
 \hline
 P = 11 & \boxed{P = 11} &
 \end{array}$$

4. A local school sold 230 tickets for their performance of Hamlet. They sold a combination of regular tickets and student tickets. The regular tickets sold for \$8 each and the student tickets sold for \$5. That night they collected \$1522 in ticket sales.

- a. Write an equation that describes each piece of information. Let '**R**' represent the number of regular tickets and '**S**' represent the number of Student tickets.

$$\begin{array}{l}
 S + R = 230 \\
 5S + 8R = 1522
 \end{array}$$



- b. Using the system of equations determine the number of each type of ticket that was sold.

$$\begin{array}{rcl}
 5 \cdot & \boxed{S + R = 230} & \cdot 8 \\
 -1 \cdot & \boxed{5S + 8R = 1522} & \cdot -1 \\
 \hline
 5S + 5R = 1150 & & 8S + 8R = 1840 \\
 + -5S - 8R = -1522 & & -5S - 8R = -1522 \\
 \hline
 -3R = -372 & & 3S = 318 \\
 \hline
 -3 & & 3 \\
 \hline
 R = 124 & \boxed{R = 124} &
 \end{array}$$

$$\begin{array}{rcl}
 S + R = 230 \\
 S + 124 = 230 \\
 \hline
 -124 & -124 & \\
 \hline
 S = 106 & \boxed{S = 106} &
 \end{array}$$

5. At the Hardware store, they sell 6 pound bags of grass seed for \$15 and they sell 20 pound bags of grass seed for \$40. A landscaping company purchased a total of 14 bags of the grass seed mentioned and paid a total of \$435. How many of each type of bag did the company purchase?



$S = \# \text{ OF SMALL BAGS}$
 (6 lbs)
 $L = \# \text{ OF LARGE BAGS}$
 (20 lbs)

$$\begin{array}{r}
 15 \cdot S + L = 14 \\
 -1 \cdot 15S + 40L = 435 \\
 \hline
 15S + 15L = 210 \\
 -15S - 40L = -435 \\
 \hline
 -25L = -225 \\
 \underline{-25} \quad \underline{-25} \\
 L = 9
 \end{array}$$

$$\begin{array}{r}
 S + L = 14 \\
 S + 9 = 14 \\
 \hline
 -9 \quad -9 \\
 \hline
 S = 5
 \end{array}$$

6. Janice left home at 12:00 pm. She drove to the airport at an average speed of 40 miles per hour. The airport is a distance of 70 miles away from her house. Her husband, Mike, realized she forgot to take her bathroom bag for her trip and left the same house at 12:30 pm to go to the airport. He averaged 60 miles per hour on the trip.

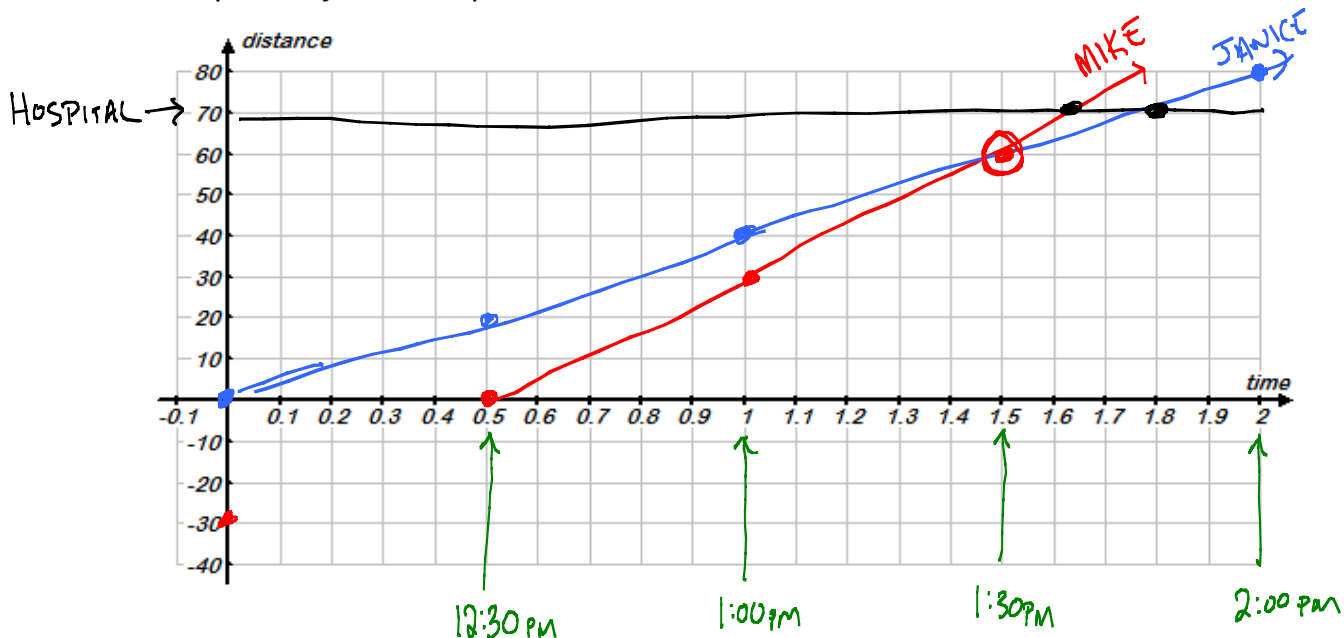
- a. Let 'y' represent the distance each person is away from their house and 'x' represent the number of hours traveled after 12:00pm. Write an equation describing each person's distance away from their house.

Janice: $y = 40x + 0$

Mike: $y = 60x - 30$ ← ONLY CORRECT AFTER 12:30



- b. Graph the system of equations below:



- c. Will Mike catch up to Janice before she gets to the airport? If so, at what time would he catch up with her? HE CATCHES UP WITH HER AT 1:30 PM

- d. Approximately what time would each arrive at the airport?

JANICE : 1.75 HOURS AFTER 12:00 (1:45 PM)

MIKE : 1.67 HOURS AFTER 12:00 (1:40 PM)

$$\begin{array}{r}
 70 = 40x \\
 70 = 60x - 30 \\
 +30 \quad +30 \\
 \hline
 100 = 60x \\
 \frac{100}{60} = \frac{60x}{60} \\
 \frac{5}{3} = x
 \end{array}$$

7. CarStax is a used car dealership. At CarStax they pay their salespeople \$550 a week plus \$150 for each car they sell. Andy's Autos is another used car dealership. At Andy's they pay their salespeople \$400 a week plus \$180 for each car sold

- a. Let 'y' represent the amount a sales person earns in a week and 'x' represent the number of cars sold each week. Write an equation describing each dealership's salary for a sales person.

CarStax: $y = 150x + 550$

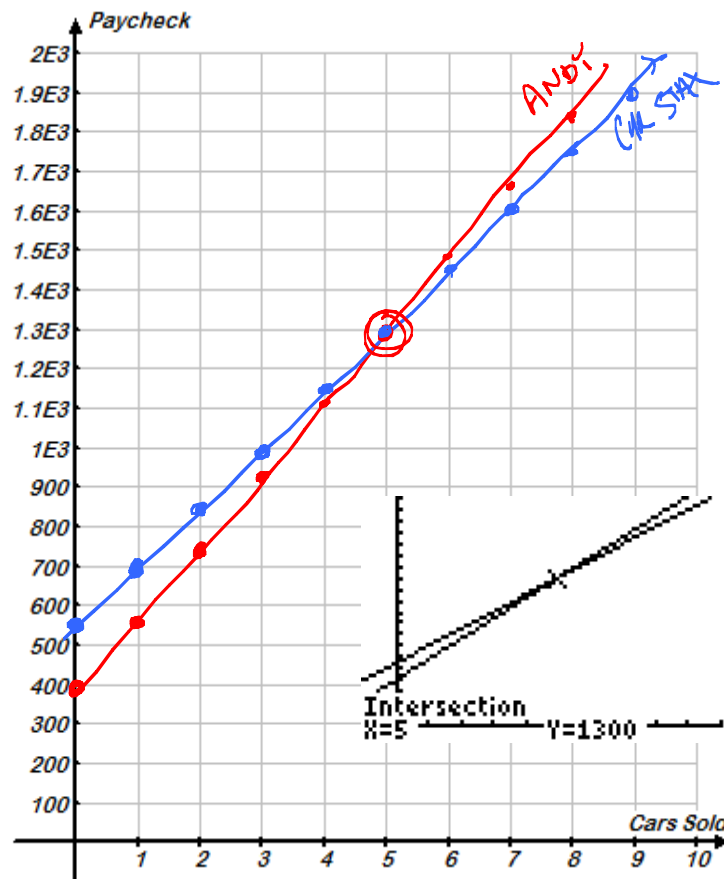
Andy's Autos: $y = 180x + 400$

- b. Graph the system of equations below:

```

Plot1 Plot2 Plot3
\Y1=150X+550
\Y2=180X+400
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
WINDOW
Xmin=-1
Xmax=10
Xscl=1
Ymin=-100
Ymax=2000
Yscl=100
Xres=1

```



- c. At what point do the two dealerships pay the salesperson the same amount?

5 CARS

- d. Determine when each dealership pays a higher salary.

CARSTAX PAYS MORE WHEN $0 \leq x < 5$

ANDY'S PAYS MORE WHEN $x > 5$