1. You and your 5 best friends go to the movies at Lloyd center. For some reason, the prices are not given for red Icee drinks and large Milk Duds. The cashier tells you that 5 red Icees and 4 large Milk Duds will cost $35.50. He also says that 7 red Icees and 3 large Milk Duds will cost $41.25. You volunteer to figure out the prices because you want to show off your math skillz.

- What is the price of one red Icee?
- What is the price of one Milk Dud?
- If you and your friends each buy 1 red Icee and 2 Milk Duds, how much will your group pay in total?

Let $x$ = price of icee, $y$ = price of milk dud

$$3 \cdot (5x + 4y = 35.50) \rightarrow 15x + 12y = 106.50$$
$$4 \cdot (7x + 3y = 41.25) \rightarrow (28x + 12y = 165)$$

$$-13x = -58.5$$
$$\boxed{x = 4.5}$$

$$5(4.5) + 4y = 35.50 \quad \text{Plug in } x$$
$$22.5 + 4y = 35.50$$
$$4y = 13$$
$$\boxed{y = 3.25}$$

You + 5 friends = 6 people.
$1x + 2y = 4.5 + 2(3.25) = 11$.

Your group will pay $6 \cdot 11 = \$66$

2. You've got a summer job working at the fair selling balloons and stuffed animals. You don't think the manager has set the prices in the best way. You do a little research and find out two things. At the current prices, you will sell 12 balloons and 8 stuffed animals for $60. If you reduce the price of a balloon by $1 and double the price of the stuffed animal, the 12 balloons and 8 stuffed animals will sell for $72.

- What is the original price of a balloon?
- What is the original price of a stuffed animal?
- If you sell 5 balloons and 9 stuffed animals at the NEW price, how much do you make?

Let $x$ = original balloon price, $y$ = original stuffed animal price

$$\boxed{12x + 8y = 60}$$
$$12(x-1) + 8(2y) = 72$$
$$12x - 12 + 16y = 72$$
$$\phantom{12x} +12 \phantom{+ 16y} +12$$
$$12x + 16y = 84$$
$$\rightarrow -(12x + 8y = 60)$$
$$8y = 24$$
$$y = 3$$

$$12x + 8(3) = 60$$
$$12x + 24 = 60$$
$$\phantom{12x} -24 \phantom{=} -24$$
$$12x = 36$$
$$x = 3$$

New prices: balloon = 2
Stuffed animal = 6
$$5b + 9s$$
$$5 \cdot 2 + 9 \cdot 6 = 10 + 54 = \$64$$

3. You're starting a business selling hats (Make Algebra Great Again?). The total cost for supplies to make your hats is $12,750. You make a total of 1000 hats. Some hats are plain, and some hats have logos. Your goal is to make back your costs by the end of a 2-day sale.

On the first day you sell 500 total hats and collect $5750. Plain hats cost $10 and logo hats cost $12.

On the second day you realize you need to raise prices to make back your money. You raise the price of plain hats by $1 and raise the price of logo hats by $3. You sell exactly the same number of EACH type of hat on the second day.

Will you make enough money to pay back your costs?

Let $x = \#$ of plain hats, $y = \#$ of logo hats

Day 1
$$10 \cdot (x + y = 500)$$
$$10x + 12y = 5750$$
$$-(10x + 10y = 5000)$$
$$\frac{2y}{2} = \frac{750}{2}$$
$$y = 375$$
$$x + 375 = 500$$
$$x = 125$$

You sell 125 plain hats & 375 logo hats.

Day 2 | Same quantities, new prices.
New plain cost = $11 (10+1), New logo Cost = $15 (12+3)
Sell 125 plain & 375 logo.
So you make $125 \cdot 11 + 375 \cdot 15 = 7000$

Answer| You made $5750 on day 1 and $7000 on day 2.
So you made $12,750, and supplies cost $12750.
You break even (neither earn nor lose money).