

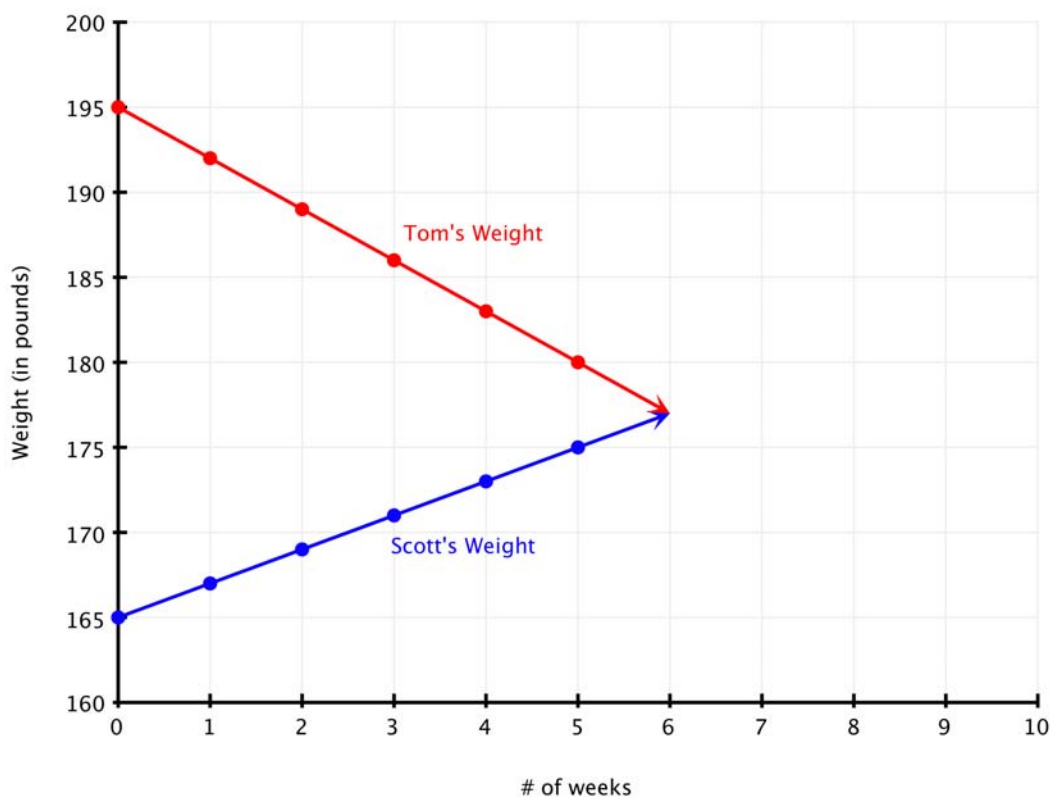


- Tom and Scott are beginning a training program for the upcoming football season. Tom weighs 165 pounds and plans to gain 2 pounds per week through this training program. Scott weighs 195 pounds and plans to lose 3 pounds per week. If their plans work, in how many weeks will they weigh the same amount? What will their weight be at that time?

**Table**

Weeks	Tom's Weight	Scott's Weight
0	165	195
1	167	192
2	169	189
3	171	186
4	173	183
5	175	180
6	177	177

**Graph**





### Equation

w: number of weeks

p: number of pounds

Tom's and Scott's weights, in pounds, can be represented by the following equations. To check the graphical solution, substitute the value of  $m = 30$  into both equations and check to see if the weight is the same.

### Tom's Weight

$$p = 165 + 2w$$

$$p = 165 + 2(6)$$

$$p = 177$$

### Scott's Weight

$$p = 195 - 3w$$

$$p = 195 - 3(6)$$

$$p = 177$$

Tom and Scott both weigh 177 pounds after 6 weeks.

- Sherri wishes to have her house painted. She contacts two companies to get quotes on what they would charge for painting her house. The A-1 Painting Company would charge Sherri \$420 initially plus \$9 per hour. Houses-R-Us would have an initial charge of \$300 plus \$14 per hour. After how many hours does A-1 Painting Company become a better value than Houses-R-Us?

Table

# of Hours	Cost for A-1	Cost for Houses-R-Us
1	429	314
2	438	328
3	447	342
4	456	356
5	465	370
10	510	440
15	555	510
20	600	580
<b>24</b>	<b>636</b>	<b>636</b>
25	645	650

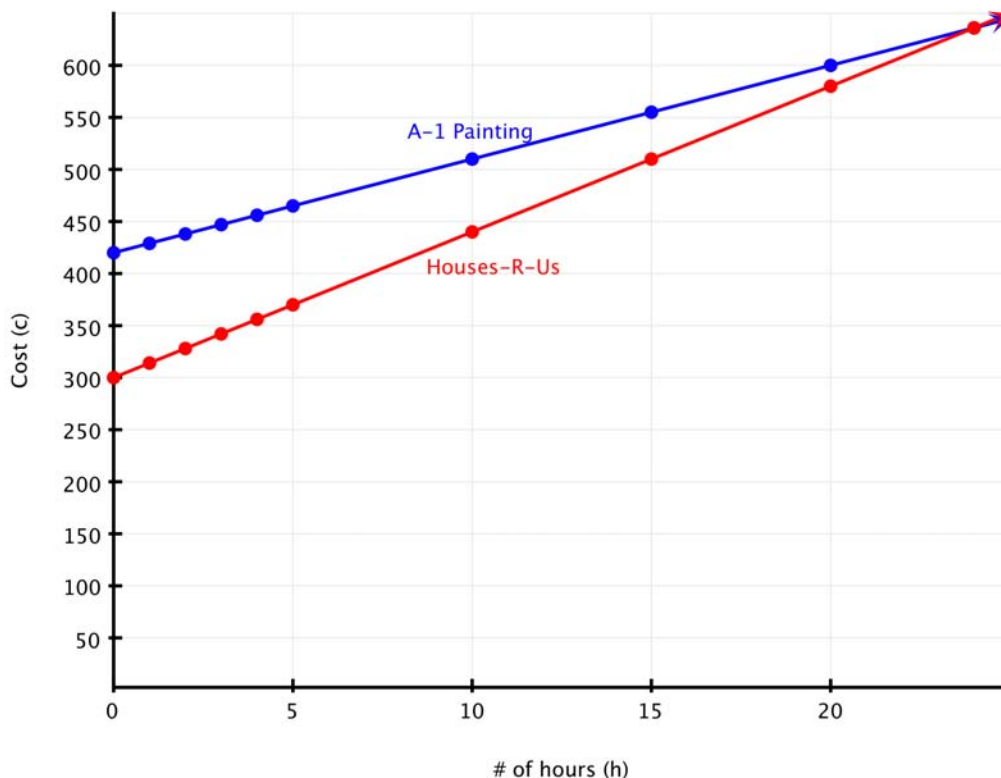
The Houses-R-Us is a better value.

Cost is the same.

A-1 Painting is a better value.



### Graph



### Inequality

h: number of hours

c: total cost

The total cost can be represented by the following equations. To check the graphical solution for when A-1 Painting is a better value, we can substitute any value of  $h \geq 24$  into both equations and check to see if the cost for A-1 Painting is less than Houses-R-Us. Shown below is  $h = 25$  but any value of  $h \geq 24$  will work.

#### Cost for A-1 Painting

$$c = 9h + 420$$

$$c = 9(25) + 420$$

$$c = 645$$

#### Cost for Houses-R-Us

$$c = 14h + 300$$

$$c = 14(25) + 300$$

$$c = 650$$

A-1 Painting becomes a better value after 24 hours of painting.



3. Jennifer would like to get broadband Internet service for her house. She is considering either the local phone company or the cable TV provider. Jennifer finds that the phone company would have no activation fee but their charge for service is \$35 per month. The cable TV company has a \$120 activation fee with a \$20 per month charge for service. After how many months of service would the cable TV company become the better value?

**Table**

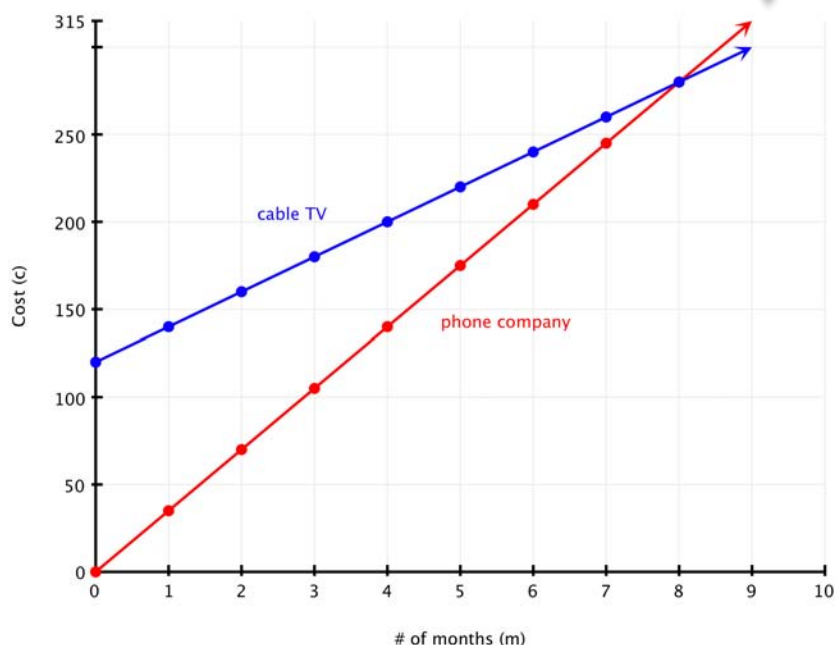
# of months	phone co.	cable TV
1	35	140
2	70	160
3	105	180
4	140	200
5	175	220
6	210	240
7	245	260
8	280	280
9	315	300

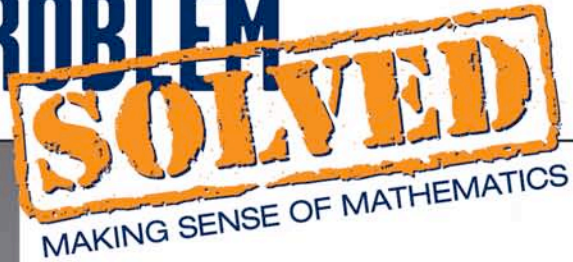
The phone company is a better value.

Cost is the same.

Cable TV is a better value.

**Graph**





### Inequality

h: number of months

c: total cost

The total cost can be represented by the following equations. To check the graphical solution for when the cable TV company is a better value, we can substitute any value of  $m \geq 8$  into both equations and check to see if the cost for the cable TV is less than the cost for the phone company. Shown below is  $m = 9$  but any value of  $m \geq 8$  will work.

#### phone company

$$c = 35m$$

$$c = 35(9)$$

$$c = 315$$

#### cable TV

$$c = 20m + 120$$

$$c = 20(9) + 120$$

$$c = 300$$

The cable TV company becomes a better value after 8 months of service.