

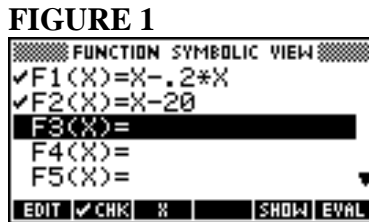
## Find the Better Deal

You will use your HP 39gs to explore the prices and discounts of several popular items and determine which type of sale provides you with the better deal.

The table shows five items and the cost of those items. You will use the HP 39gs to help you determine whether a 20% discount or a \$20 discount is a better deal.

Item	Original Cost
game console	\$250
game	\$100
cell phone	\$50
MP3 Player	\$120
portable DVD player	\$75

On the calculator, press the APLET key and choose **Function**. Enter  $F1(X) = X - .20X$  and  $F2(X) = X - 20$  as shown in Figure 1.



### EXERCISES

- 1) Which function will give the price after the 20% discount? Explain your answer.
- 2) Which function will give the price after the \$20 discount? Explain your answer.
- 3) Use the HP 39gs to complete the table. Press the SHIFT of the NUM key (Numeric SetUp). Next to the NUMTYPE option, press the CHOOS menu key and choose **Build Your Own**. Now press the NUM key and enter the original prices into the column labeled  $X$ . Values for  $F1(X)$  and  $F2(X)$  will appear on the screen.

Item	Original Cost	Price after 20% discount	Price after \$20 discount
game console	\$250		
game	\$100		
cell phone	\$50		
MP3 Player	\$120		
portable DVD player	\$75		

- 4) Which items are a better buy with the 20% discount?
- 5) Which items are a better buy with the \$20 discount?
- 6) Are any of the items the same no matter which discount is used?

One way to determine the cost at which the type of discount does not make a difference is to graph the two functions and see where the lines intersect. At that point of intersection, the type of discount will not make a difference. To see this on your HP 39gs, complete the following steps.

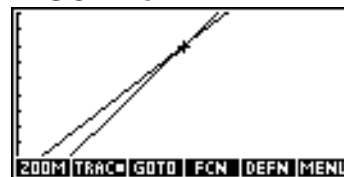
Press the SHIFT of the PLOT key (Plot SetUp) to set up your graphical view. Use the values shown in Figure 2.

**FIGURE 2**



Press the PLOT key to see the graph of the two functions. You should see that they intersect. (Figure 3)

**FIGURE 3**



To see where they intersect, press the MENU menu key, then press the FCN menu key and choose **Intersection** between  $F1(X)$  and  $F2(X)$  as seen in Figures 4, 5, and 6.

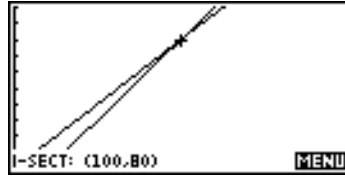
**FIGURE 4**



**FIGURE 5**



**FIGURE 6**



7) Explain what the intersection point of  $(100, 80)$  means in terms of prices.

Change the problem so that one discount is 25% and the other is \$30. Change  $F1(X)$  and  $F2(X)$  to reflect these new discounts.

8) Complete the table with the new amounts.

Item	Original Cost	Price after 25% discount	Price after \$30 discount
game console	\$250		
game	\$100		
cell phone	\$50		
MP3 Player	\$120		
portable DVD player	\$75		

9) Which items are a better buy with the 25% discount?

10) Which items are a better buy with the \$30 discount?

11) Are any of the items the same no matter which discount is used?

12) Use the graphing method above to determine the price at which the type of discount does not matter.

In Exercises 6 and 7, you discovered products and prices at which the type of discount did not matter.

13) Using the 20% and \$20 discount information for any price over \$100, which is the better type of discount?

14) Using the 25% and \$30 discount information for any price over \$120, which is the better type of discount?

15) Anytime you have a percent discount and a dollar discount, there will be a price for which the type of discount does not matter. Make a generalization about prices that are above that amount and what type of discount is better for higher priced items.