

# Drawing Line Graphs

## Drawing a figure using a linear function

**Objective:** One application of linear functions is to draw figures and graphs using straight lines. First, practice drawing methods and usage, and then have students derive formulas to produce their own figures. They can also exchange data to communicate with their classmates. The purpose of the exercise is to have fun with line graphs.

### Instruction Procedure

#### 1. What is this? (Practice in operation)


$$y = 3x + 6, [-2, 0]$$

$$y = -3x - 6, [-2, 0]$$

$$y = -3x + 6, [0, 2]$$

$$y = 3x - 6, [0, 2]$$

- Use the graphic calculator to draw the figure.

Use the cursor keys (  ) to highlight the GRAPH menu, and then press **EXE**.

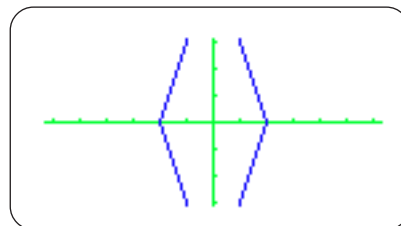
- Input the formulas.

**3** **X,θ,T** **+** **6** **,** **SHIFT** **+** **(←)** **2** **,** **0** **SHIFT** **-** **EXE**  
**(←)** **3** **X,θ,T** **-** **6** **,** **SHIFT** **+** **(←)** **2** **,** **0** **SHIFT** **-** **EXE**  
**(←)** **3** **X,θ,T** **+** **6** **,** **SHIFT** **+** **0** **,** **2** **SHIFT** **-** **EXE**  
**3** **X,θ,T** **-** **6** **,** **SHIFT** **+** **0** **,** **2** **SHIFT** **-** **EXE**

```
Graph Func :Y=
Y1=3X+6, [-2,0]
Y2=-3X-6, [-2,0]
Y3=-3X+6, [0,2]
Y4=3X-6, [0,2]
Y5:
Y6:
To Store : [EXE]
```

- What does it look like?

**F6** (DRAW)



Change View Window settings so that the entire picture fits in the screen.

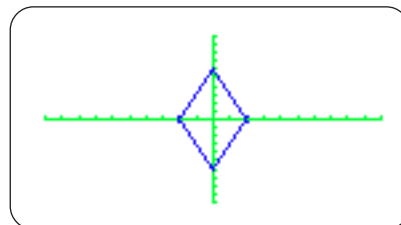
**SHIFT** **F3** **F3** **EXE**  
**SHIFT** **F3** (V-WIN) **F3** (STD) **EXE**

```
View Window
Xmin :-10
max :10
scale:1
Ymin :-10
max :10
scale:1
[INIT] [TRIG] [STD] [STO] [RCL]
```

Draw the figure.

**F6** (DRAW)

The  $[a, b]$  are the range.

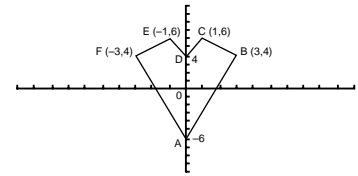


It's a diamond.

**2. Can you draw this figure?**

Use the graphic calculator to draw the heart shown here.

Determine the formulas and ranges for line segments AB, BC, CD, DE, EF, and FA.

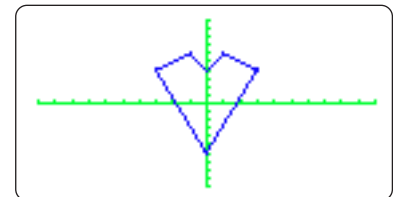


Hint

- After inputting formulas

**F6** (DRAW)

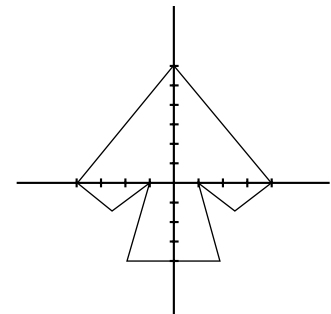
```
Graph Func :Y=
Y1 10.3X-6, [0, 3]
Y2 -X+7, [1, 3]
Y3 2X+4, [0, 1]
Y4 -2X+4, [-1, 0]
Y5 X+7, [-3, -1]
Y6 -10.3X-6, [-3, 0]
To Store : [EXE]
```



**3. Now try this one.**

Use the graphic calculator to draw the spade shown here.

Determine the coordinates by yourself.



**4. Give the picture that you “draw” to your friend.**

- (1) First, decide on a figure or mark of your own. A letter is OK, too!
- (2) Use straight lines to draw the figure. You can use up to 20 formulas.
- (3) Write the formulas and ranges on a piece of paper and exchange them with a friend.
- (4) Use formulas from your friend to draw the figure on the graphic calculator.