RUN GRAPH

fx-7400G

X Marks the Spot!

Linear Equations
Solving
Graphing
Substitution
Using intercepts

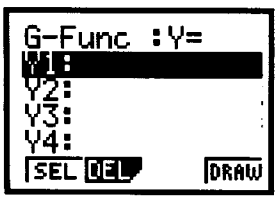
Standards: Problem Solving, Communication, Reasoning, Functions, and Algebra

Materials: *fx-7400G*

Calculator Use: GRAPH Menu, DRAW(F4),

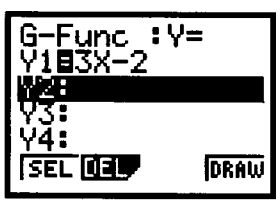
How to Graph Equations

Enter the Graph Menu. The **G-Func** screen is shown below.

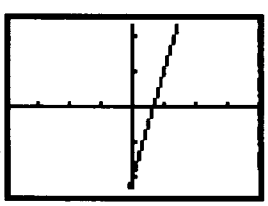


While Y1 is highlighted:
Press 3
X,T key
- key
2
EXE (stores the equation)

Please remember that X is the **X,T** key directly below the red **Alpha** key. You cannot use your multiplication key for X. Your screen should be similar to the one below.



Press F4 (DRAW). The resulting graph is shown below.



? represents a high level question

How many times have you been asked to check your solutions? For example:

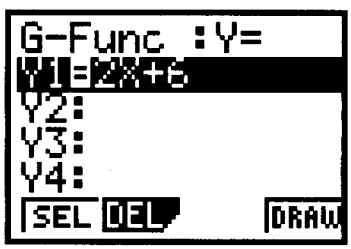
Solving the equation		Checking the solution
2X - 3 = -9		2(-3) - 3 = -9
2X = -6	add 3 from both sides	-6 - 3 = -9
X = -3	Divide both sides by 2	-9 = -9

Rewrite the original equation:

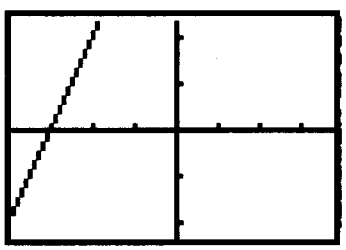
2X - 3 = -9	original equation
2X + 6 = 0	add 9 to both sides
2X + 6 = Y	substitute Y for 0

Graph the equation on your calculator.

From the main menu, go to the GRAPH (4) menu. In the **G-Func Screen**, enter 2x + 4 in for Y1. Press F4 (DRAW) to draw the graph.



Graph Function Screen



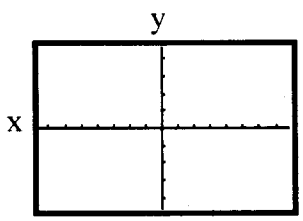
Graph of Y = 2X + 6

The point where a line crosses the x-axis is the **x-intercept**.

What is the x-intercept for the above line? **A.** _____

? What do you notice about the x-intercept and the solution for the original equation Y = 2X + 6? **B.**

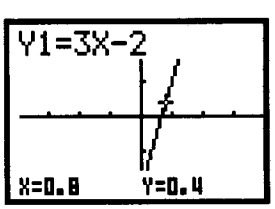
X Marks the Spot!



The Cartesian Plane is named after Rene Descartes (1596-1650 AD). The x-axis is the horizontal axis and the y-axis is the vertical axis. The Cartesian Plane is sometimes called the Coordinate Plane.

How to Trace a Graph

You can approximate the x-intercept by using the **TRACE** function. While the graph is on the screen, press **F1**. Press the right arrow until the Y value on the bottom of the screen gets close to zero. (You may not always get zero for Y but this will give you a very close approximation.)



How to Zoom In or Out

While the graph is on the screen:

Press F2 (TRACE)
F4 (OUT) zoom out
or
F3 (IN) zoom in

Repeat the process you have the desired graph window.

Solve 5X - 12 = 8 by graphing.

1. Set equation equal to zero by subtracting 8 from each side of the equation.

   5X - 20 = 0

2. Substitute Y for 0 yielding 5X - 20 = Y.

3. Enter 5X - 20 for Y1 as shown in Figure 3.

4. Graph.

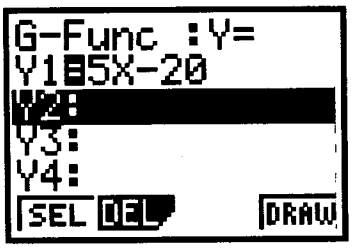


Figure 3

Notice that the line is barely on the graph screen as shown in Figure 4. To get a better view, press F2 for **Zoom** then F4 (Out). The resulting graph is shown in Figure 4.

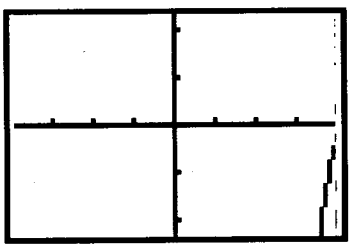


Figure 4

What is the x-intercept of the line? **C.** _____

Solve the equation for X.

What is the solution for 5X - 17 = 8? **D.** _____

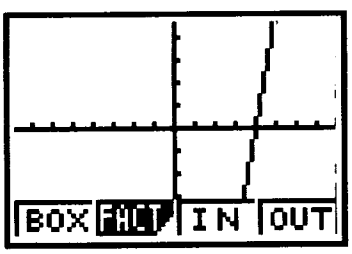


Figure 5

Find the x-intercept the following equations by graphing.

2X + 6 = 7	4X - 7 = -19	4X - 6 = 10
E. _____	**F.** _____	**G.** _____

Find the x-intercept(s) for the equations in H-J by graphing. (Hint: set each equation equal to zero, replace zero with y, and graph. Look for the x-inter cepts).

$X^2 = 4$	$X^2 + 4X + 3 = 0$	$X^2 - 3X - 10 = 0$
H. _____	**I.** _____	**J.** _____

Describe the shape of the graphs in problems H - J.
K.

How many times does each graph in H-J cross the x-axis? **L.** _____

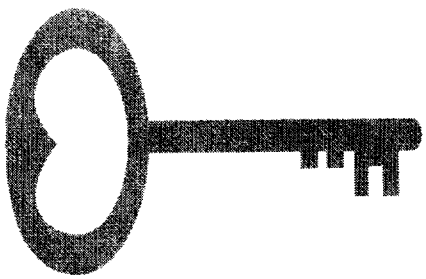
What do you notice about the x-coordinates of the x-intercepts for the corresponding equations? **M.**

Give 2 useful reasons for graphing equations:

N.

O.

Solution Key



X Marks the Spot!

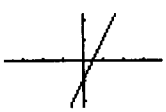
A. (-3,0)

B. The x-intercept is -2 and the solution to the equation y = 2X + 4 is also -2.

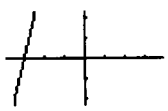
C. (4,0)

D. X = 4

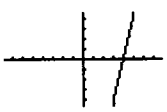
E. (-1,0)



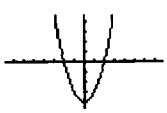
F. (-3,0)



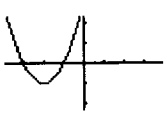
G. (4,0)



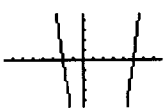
H. (-2,0) and (2,0)



I. (-3,0) and (-1,0)



J. (-2,0) and (5,0)



K. The shapes of the graphs are parabolas.

L. 2 times.

M. The x-intercepts represent the real solutions for the given equation.

N and O. Answers will vary. To find the solution for a given equation. The real solution is the where the graph crosses the x-axis. To find points of minimum and maximum for a particular problem.