

## Graphing, Evaluating Functions, and Solving Systems of Linear Equations

To enter the function  $f(x) = x^3 - 3x + 4$  into the calculator press

**Y=**

. On the line labeled **Y1**, type  $x^3 - 3x + 4$

Notes:

- Use the key **X,T,θ,n** for the variable.
- The TI-83 and TI-84 handle exponents differently. In the newer 84, you will need to cursor out of the exponent before typing the next character.

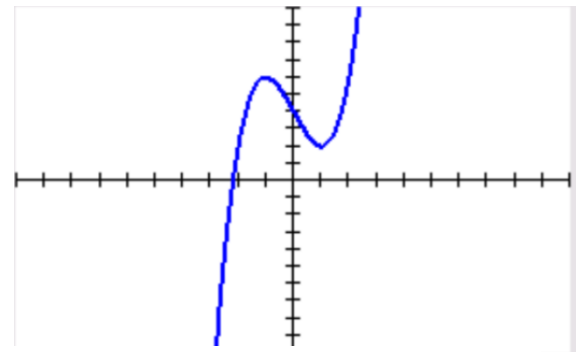
**GRAPH**

To graph the function, press

**ZOOM**

To explore various zoom options, press

- **2:** Zoom In (smaller range of  $x$  and  $y$  values, you choose center of zoom)
- **3:** Zoom Out (larger range of  $x$  and  $y$  values, you choose center of zoom)
- **5:** ZOOM Square (same scale for  $x$  and  $y$  so that circles look like circles and perpendicular lines look like right angles)
- **6:** Zoom Standard  $[-10,10] \times [-10,10]$
- **7:** Zoom Trig  $[-2\pi, 2\pi] \times [-4,4]$
- **9:** Zoom Stat (useful for graphing data in tables)
- **0:** Zoom Fit (adjusts  $y$  values so that they all graph, given the values of  $x$ )



```

WINDOW
Xmin=■10
Xmax=10
Xscl=1
Ymin=-10
Ymax=10
Yscl=1
Xres=1
ΔX=.0757575757575757
TraceStep=.1515151515151515
    
```

X	Y <sub>1</sub>	
0	4	
1	2	
2	6	
3	22	
4	56	
5	114	
6	202	
7	326	
8	492	
9	706	
10	974	

Or select **WINDOW** to adjust values manually.

To display a table of function values: **2nd** **GRAPH** to select the **TABLE** feature. You can scroll through values here.

X=0

To specify where the table starts and the increments for x-values: **2nd**

**WINDOW**, for **TBLSET**.

**TblStart** = -5 (Use the **(-)** key not **-** for negative numbers.)

**ΔTbl** = .5  
(This is how much the values will jump as you scroll through the table.)

**2nd** **GRAPH** (for **TABLE**) to see the results.

```
TABLE SETUP
TblStart=-5
ΔTbl=.5
Indpnt: Auto Ask
Depend: Auto Ask
```

To find a specific value for  $f(x)$ : There are several ways. For example evaluate  $f(3.4)$ .

- Method 1: Press **2nd** **WINDOW** (for **TBLSET**). On this screen, change **INDPNT** from **AUTO** to **ASK**, press **ENTER**. Then select **2nd** **GRAPH** (for **TABLE**). On the first line of the table, enter the value 3.4, then press **ENTER**. *The result is 33.104.*

X	Y <sub>1</sub>	
3.4	33.104	

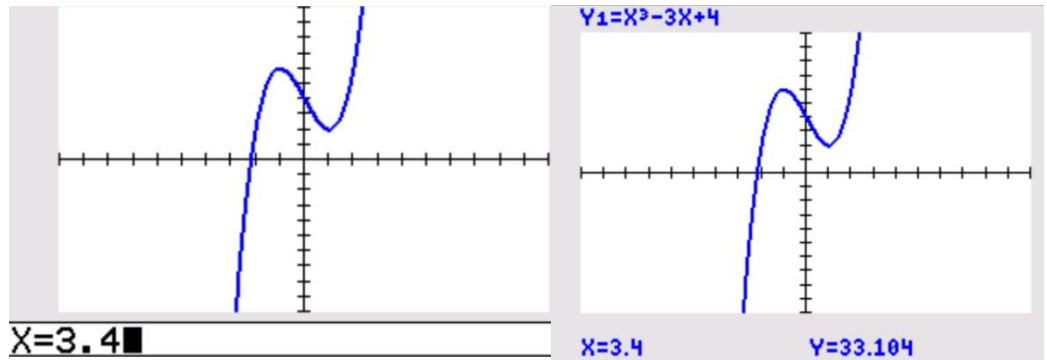
X=

- Method 2: Press **2nd** **TRACE** (for **CALC**). On this screen, select 1: Value, press **ENTER**, when prompted for the value of  $x$  (at X=) type 3.4, press **ENTER**. *The result is Y=33.104.*

**CALCULATE**

- 1:value
- 2:zero
- 3:minimum
- 4:maximum
- 5:intersect
- 6:dy/dx
- 7:∫f(x)dx

- Method 3:



Press **VAR** → **Y-VARS** **ENTER**, select 1: Function, press **ENTER**, then 1: Y1 **ENTER**.

Then on the main screen, after Y1, put in parentheses 3.4, then press **ENTER**.

The result is 33.104

**VAR** Y-VARS COLOR

- 1:Window...
- 2:Zoom...
- 3:GDB...
- 4:Picture & Background...
- 5:Statistics...
- 6:Table...
- 7:String...

Y1(3.4)  
..... 33.104

To find the solution to a system of two linear equations graphically, do the following:

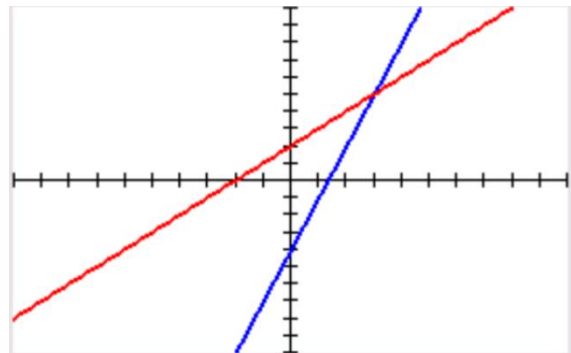
- Enter the equations of the lines:

**Y=**  
Y1 = 3x - 4  
Y2 = x + 2

- Graph the lines:

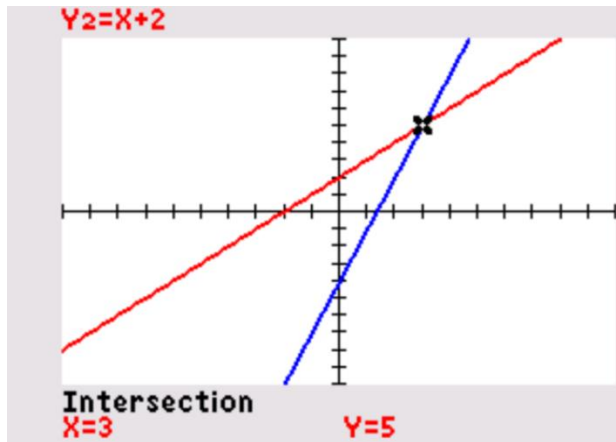
**GRAPH**

Plot1 Plot2 Plot3  
 █ Y1=3X-4  
 █ Y2=X+2  
 █ Y3=  
 █ Y4=  
 █ Y5=  
 █ Y6=  
 █ Y7=  
 █ Y8=  
 █ Y9=



- Find the intersection:

**2nd** **TRACE** (for **CALC**) 5: intersect, press **ENTER**, **ENTER**, **ENTER**.



Note: (We press  three times to accept all the defaults for linear equations. If you are graphing non-linear equations, or more than two equations, you may need to read the prompts and make choices before moving on.)

The result is: Intersection  $X=3$   $Y=5$