

Math 1311
Section 2.2
Graphs

Graphing with the calculator

- Step 1: Enter the function or functions in the Y= menu.
- Step 2: Selecting the Viewing Window:
- Step 3: Viewing the Graph:
- Step 4: Tracing the Graph and finding the function value for a particular X value.

Example 1: Graph the function $f(x) = x^2 - 2$

Step 1: Enter the function in the Y = menu.



```

Plot1 Plot2 Plot3
\Y1=X^2-2
\Y2=
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
  
```

Step 2: Set the Graphing Window in the

Window menu.

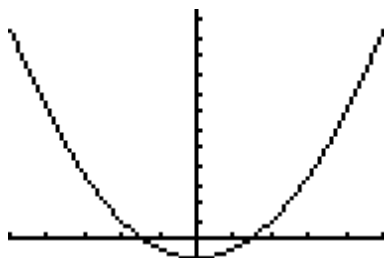


```

WINDOW
Xmin=-5
Xmax=5
Xscl=1
Ymin=-2
Ymax=25
Yscl=2
Xres=1
  
```

The Xmin is the left side of the x-axis.
 The Xmax is the right side of the x-axis.
 The Xscl is how far apart the tick marks are on the x-axis.
 The Ymin and Ymax are the smallest and largest y values on the y-axis.
 The Yscl is how far apart the tick marks are on the y-axis.
 The Xres leave at 1.

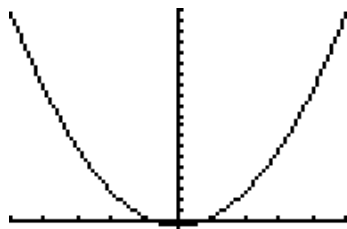
Step 3: Graph – here is what it looks like when I hit graph with the settings above.




Let me change the window settings.

```
WINDOW
Xmin=-10
Xmax=10
Xscl=2
Ymin=-5
Ymax=100
Yscl=5
Xres=1
```

Here is what it looks like now:



Sometimes using Zoom option works better.

Alternative Step 2: Press  and enter the minimum and maximum input values (Xmin and Xmax).

```
MEMORY
1: ZBox
2: Zoom In
3: Zoom Out
4: ZDecimal
5: ZSquare
6: ZStandard
7↓ZTrig
```

Alternative Step 3: Now press   to see the graph.

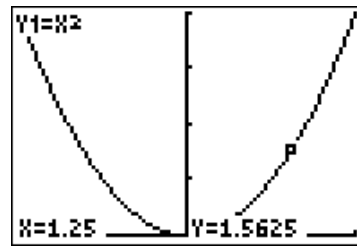
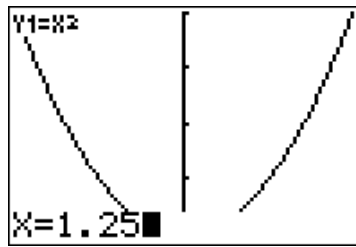
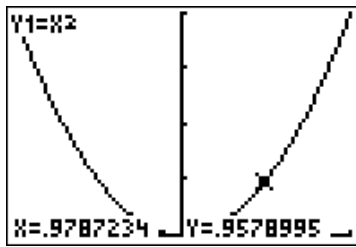
Step 4: Reading Values from the Graph

While looking at the graph, we can press , then using the left and right arrows, we can read values on the graph.

While tracing, if we enter any number (between X_{\min} and X_{\max}) and then press



Example 2: Find $f(1.25)$ for $f(x) = x^2$.



Example 3: Graph the function $f(x) = 2^x - x^2$.

- Find a good window to view the piece from $x = 0$ to $x = 5$.
- Find $f(2)$.
- Find $f(3.4)$.

Example 4: The yearly profit from the sale of n thousand widgets is

$$P(n) = -180 + 100n - 4n^2 \text{ million dollars.}$$

- Sketch a graph of this function showing values of n between 0 and 20.

b. Calculate $P(0)$ and explain in practical terms what your answer means.

c. What profit will the producer make if 15 thousand widgets are sold?

d. The break-even point is the point at which the profit is zero. Use the graph to estimate the break-even point.

e. What is the largest profit possible?

Example 5: The monthly payment on \$120000 borrowed at 6% compounded continuously if the loan is for x years is $M(x) = \frac{120000(e^{0.005}-1)}{1-e^{-0.06x}}$. Loans of this amount are typically 10 to 30 years in length. Sketch the graph of this function, and while looking at the graph, determine the monthly payment if the money is borrowed for 15 years.

f. What is the temperature of the oven?