**2M2H**

Fun with Graphing Calculators

For each equation, use a **graphing calculator** to fill in the listed information. Use the **min/max function** to find the vertex. Use the **zeroes function** to find the x-intercept(s). Use the **Calc – Value function** to find the y-intercept. Use the **table function** to record 3 points to the left of the vertex and 3 points to the right.

A. $y = -x^2 + 2x + 3$

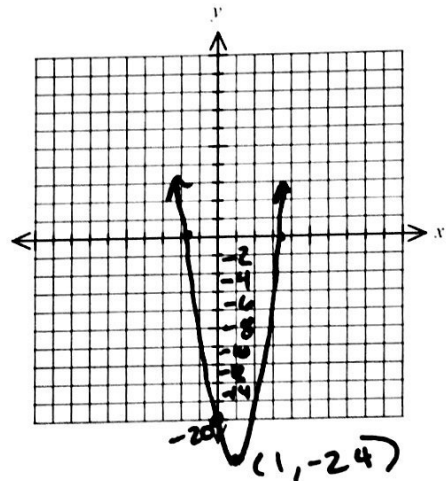Xmin = -10, Xmax=10, Ymin = -10, Ymax = 10

   a. Vertex __(1, 4)__
   b. x-intercept(s) __(3,0) (-1,0)__
   c. y-intercept __(0, 3)__
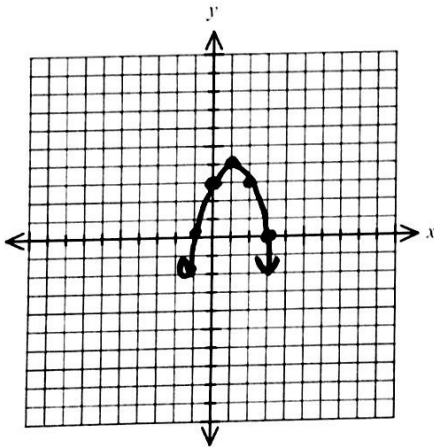
C. $f(x) = 4(x - 1)^2 - 24$
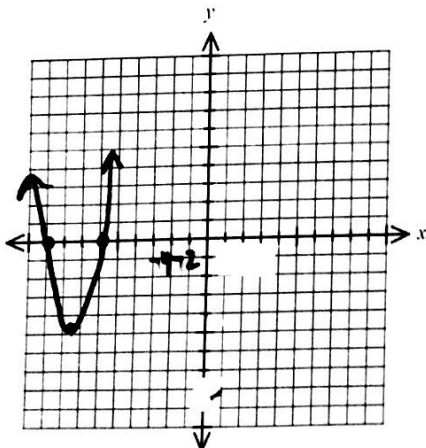
Xmin = -10, Xmax=10, Ymin = -25, Ymax = 5

   a. Vertex __(1, -24)__
   b. x-intercept(s) __(-1.45,0) (3.45,0)__
   c. y-intercept __(0, -20)__

(1, -24)

B. $f(x) = (x + 15)^2 - 9$

Xmin = -25, Xmax=5, Ymin = -10, Ymax = 10
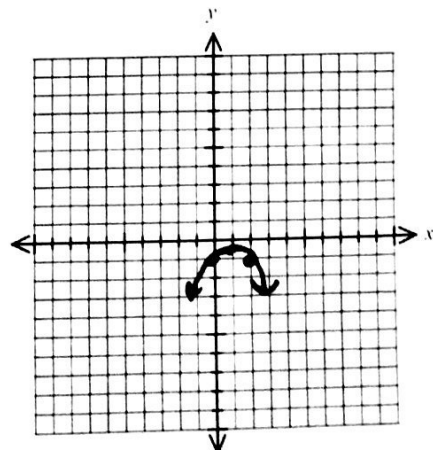
   a. Vertex __(-15, -9)__
   b. x-intercept(s) __(-12, 0) (-18,0)__
   c. y-intercept __(0, 216)__

D. $y = -0.5x^2 + x - 1$

Xmin = -10, Xmax=10, Ymin = -10, Ymax = 10

   a. Vertex __(1, -.5)__
   b. x-intercept(s) __none__
   c. y-intercept __(0, -1)__

GRAPHING CALCULATOR GUIDE FOR PARABOLAS

GRAPHING AN EQUATION

On your graphing calculator, press **y =** at the top. This is where you enter the equation you want to graph. Type in the quadratic equation below.

$$y = x^2 - 2x - 3$$

Make sure the equal sign is highlighted with a dark box. (You can use the arrows to get to the equal sign if needed. Press enter to make it turn bold.)

Now press **GRAPH**.

ADJUSTING THE VIEW WINDOW

Adjust the view by pressing **WINDOW**. Change the window so that the x-axis stretches from -4 to 4 and the y-axis stretches from -4 to 4. Press **GRAPH** to view the graph again.

Now **change the window** to view the x-axis and y-axis from -10 to 10.

FINDING THE VERTEX

To find the vertex of the parabola shown, press **2ND** and then **CALC (above TRACE)**. Select **MINIMUM** since this parabola opens up. The calculator will ask you for "LEFT BOUND." Use the arrows to move somewhere to the left of the vertex. Press **ENTER**. Do the same for right bound, moving to the right. Then, the calculator says "GUESS?" Use the arrows to move as close to the vertex as possible. Then press **ENTER**. The calculator will then give you the coordinates for the vertex.

Note: Sometimes the calculator gets a little confused and will give you a number like 1.499999998. Most likely, it means 1.5.

FINDING THE X INTERCEPTS

To find the x-intercepts (AKA the ZEROS since the y-value is 0), press **2ND** and then **CALC (above TRACE)**. Select **ZERO**. Use the same process as for the vertex, moving to the left and right of one of the x-intercepts. Repeat the process for the second x-intercept.

FINDING THE Y INTERCEPT AND OTHER POINTS

To find the y-intercept, press **2ND** and then **CALC (above TRACE)**. Select **VALUE**. Now you can enter any x-value to find its corresponding y-value. Enter 0 to find the y-intercept. Try other numbers.

Use your graphing calculator to graph each equation the task cards. Then find the following and record on your paper:
- Vertex
- X-Intercepts
- Y-Intercept
- Notice if the parabola open up or down