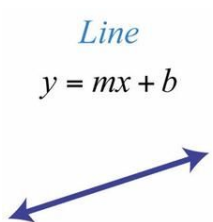


Please be prepared to hand in.

Notes

Graphs

We know that any linear equation with two variables can be written in the form $y=mx+b$ and that its graph is a line. In this section, we will see that any quadratic equation of the form $y=ax^2+bx+c$ has a curved graph called a parabola.

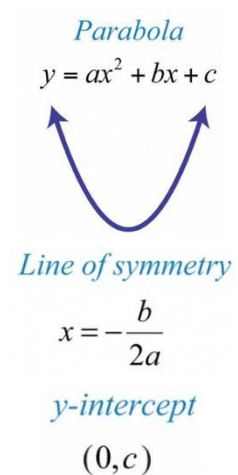


A line has a constant rate of change, or slope.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

y-intercept: $(0, b)$

Point-Slope Form: $y = m(x - h) + k$
 Standard Form: $ax + by = c$



Line of symmetry

$$x = -\frac{b}{2a}$$

y-intercept

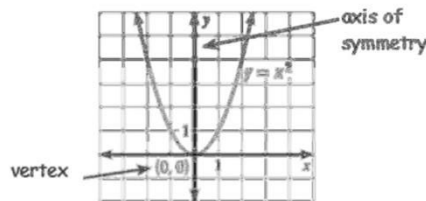
$(0, c)$

Quadratic Equations (Parabolas)

- Quadratic Function (**Parabola**) Standard Form:

$$f(x) = ax^2 + bx + c, \text{ where } a \neq 0$$

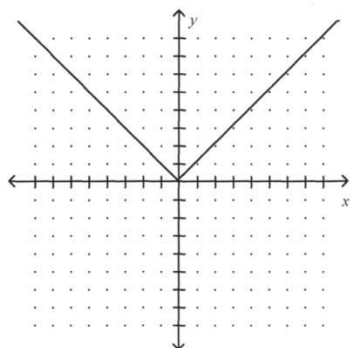
- Parent Function: $y = x^2$
- axis of symmetry:** line that passes through the vertex dividing the parabola into two symmetric parts



$$\text{The axis of symmetry is found by the equation } x = -\frac{b}{2a}$$

- vertex:** lowest or highest point of the parabola (maximum/minimum; turning point)
 - Since the vertex is on the axis of symmetry, find its x -value by using $x = -\frac{b}{2a}$
 - Find its y -value by plugging its x -value back into the function equation

Absolute Value Parent Graph:



Similar to a parabola, there is a turning point.

$$= |x - h| + k$$

Vertex (h, k)

Please be prepared to hand in.

Homework

1. Find the equation of the line which passes through point (3,4) and has a slope +2.
(Hint: you only need to find the intercept and write $y = mx+b$)
2. Find the equation of the line through points (-2, 0) and (0,2).
3. Graph $y = x^2 - 4$
4. Graph $y = -\frac{1}{2}x^2 + x + 2.5$
5. Graph $y = |x| + 2$
6. Graph $y = -|x + 1| + 4$