

# Square Root Functions

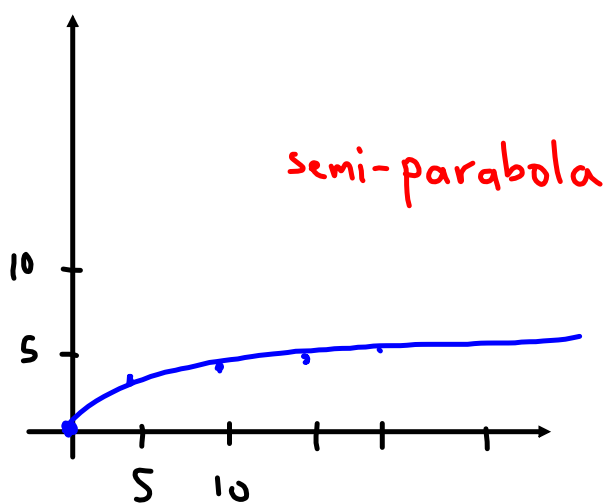
Goal:

- to become familiar with square root functions
- to understand how the parameters affect the graph of a square root function

The most basic square root function is  $f(x)=\sqrt{x}$

What does the graph of this function look like?

x	y
-10	-
-5	-
0	0
5	$\sqrt{5}$
10	$\sqrt{10}$



Square root functions can be represented using a standard form:

$$f(x) = a \sqrt{b(x-h)} + k$$

where a, b, h and k are parameters

remember:

$$f(x) = a(x-h)^2 + k \quad \text{quadratic}$$

$$f(x) = a[b(x-h)] + k \quad \text{greatest integer}$$

How does each parameter affect the graph?

Parameter "a" :

- causes a vertical scale change  
vertical stretch/compression
- if  $a < 0$  the semi-parabola is vertically reflected (about x-axis)

Parameter "b" :

- causes horizontal scale change
- if  $b < 0$ , semi-parabola is reflected horizontally (about y-axis)

Parameter "h" :

- causes horizontal translation of h units

Parameter "k" :

- causes vertical translation of k units

Semi-parabola has vertex  $V(h, k)$

sketch  $f(x) = -3\sqrt{2(x-1)+5}$

$$g(x) = \frac{1}{2}\sqrt{-4(x+1)} - 3$$