

June 22, 2017

Transformations of Functions

$$a(x-h)^m + k$$

① how it opens
 ② Stretching or shrinking

Horizontal Change
 ① if $h > 0$, then right
 ② if $h < 0$, then left

Vertical Change
 ① if $k > 0$, then up
 ② if $k < 0$, then down

Jun 22-8:00 AM

$$g(x) = \boxed{} \sqrt{x - \boxed{3}} + \boxed{4}$$

opens up 3 units to right 4 units up

$$f(x) = \sqrt{x} ; x \geq 0$$

$$h(x) = \sqrt{x+2} - 3$$

$h = -2$ -3

Jun 22-8:11 AM

① $g(x) = \sqrt{x-3} + 4$
 Domain: $[3, \infty)$
 $x-3 \geq 0$
 $x \geq 3$

② $f(x) = \sqrt{x} = \sqrt{x-0} + 0$
 Domain: $[0, \infty)$

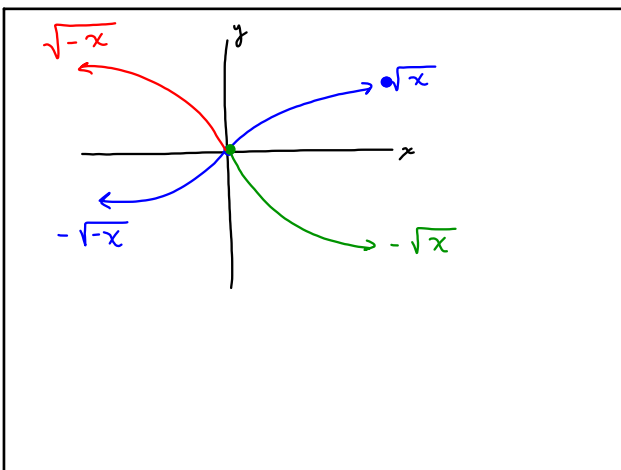
③ $h(x) = \sqrt{x+2} - 3$
 $x+2 \geq 0$
 $x \geq -2$
 Domain: $[-2, \infty)$

Jun 22-8:20 AM

Transformations of a

- if $a > 0$, opens up
- if $a < 0$, opens down
- if $a > 1$, then a stretch of parent
- if $0 < a < 1$, then a shrink of the parent

Jun 22-8:31 AM



Jun 22-9:23 AM

$$\sqrt{\frac{x^2+4x+4}{x^2-9}} \geq 0$$

$$\sqrt{\frac{(x+2)(x+2)}{(x+3)(x-3)}} \geq 0$$

$$\frac{(x+2)(x+2)}{(x+3)(x-3)} \geq 0$$

$$\sqrt{(x+2)^2} = |x+2|$$

$$x+2 \geq 0 \Rightarrow x \geq -2$$

$$x+2 \leq 0 \Rightarrow x \leq -2$$

$$x+3 > 0 \Rightarrow x > -3$$

$$x-3 < 0 \Rightarrow x < 3$$

$$\frac{(-4)^2 + 4(-4) + 4}{(-4)^2 - 9} \geq 0$$

$$\frac{16 - 16 + 4}{16 - 9} \geq 0$$

$$\frac{4}{7} \geq 0$$

$$\frac{(-2)^2 + 4(-2) + 4}{(-2)^2 - 9} \geq 0$$

$$\frac{4 - 8 + 4}{4 - 9} \geq 0$$

$$\frac{0}{-5} \geq 0$$

$(-\infty, -3) \cup [-2] \cup (3, \infty)$

Jun 22-10:22 AM