

## 6.3 Square Root Functions & Inequalities

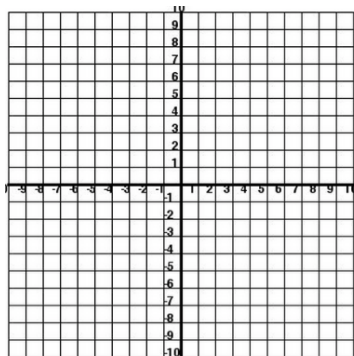
**objectives:** graph & analyze square root functions  
graph square root inequalities

**Parent Function:**  $f(x) = \sqrt{x}$

**Domain:**

**Range:**

**Minimum:**

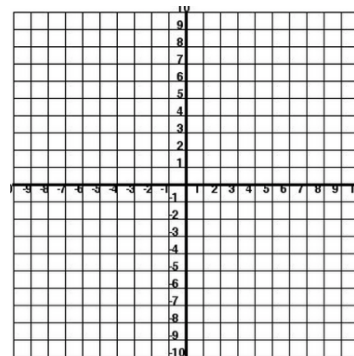


$f(x) = \sqrt{x - 4}$

**Domain:**

**Range:**

**min:**

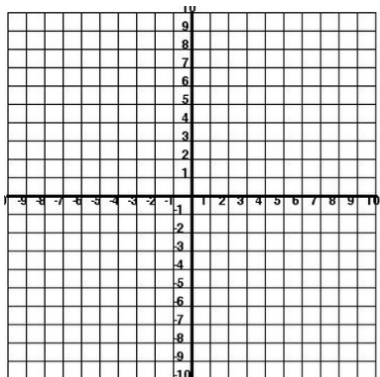


**Transformations of square root functions.  $f(x) = a\sqrt{x - h} + k$**

Identify the transformations. Graph. State the domain and range of each function.

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

x	y



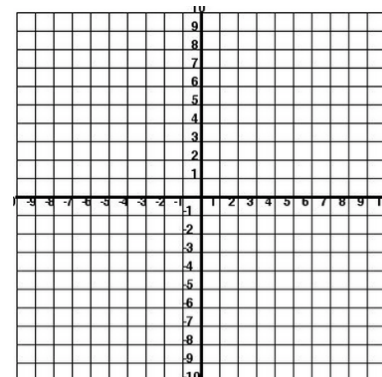
**D:**

**R:**

**Minimum:**

2.  $f(x) = \sqrt{x + 6} - 2$

x	y



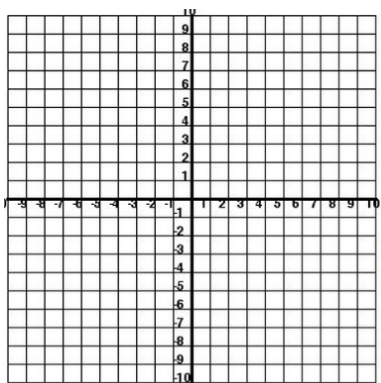
**D:**

**R:**

**minimum:**

3.  $f(x) = -\sqrt{x + 3} - 1$

x	y



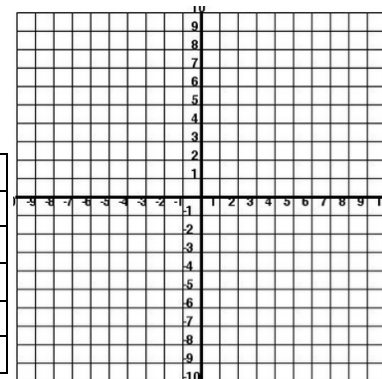
**D:**

**R:**

**Maximum:**

4.  $f(x) = -2\sqrt{x - 1} + 4$

x	y



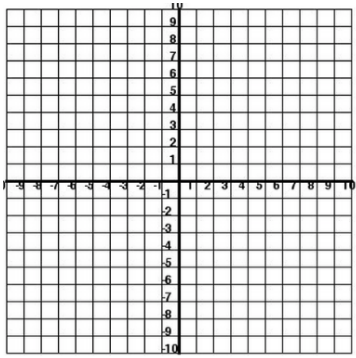
**D:**

**R:**

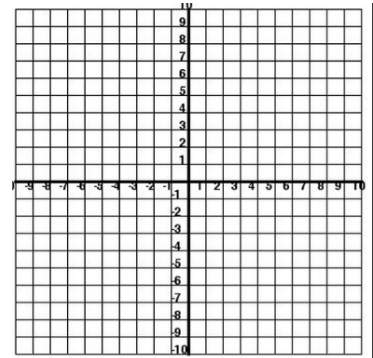
**maximum:**

## Square Root Inequalities

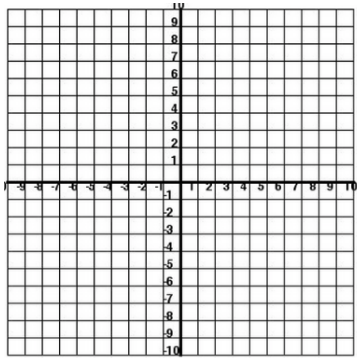
Ex.  $y < \sqrt{x - 4} + 2$



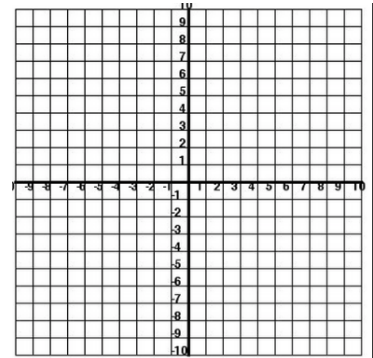
5.  $y \leq \sqrt{x - 4} - 2$



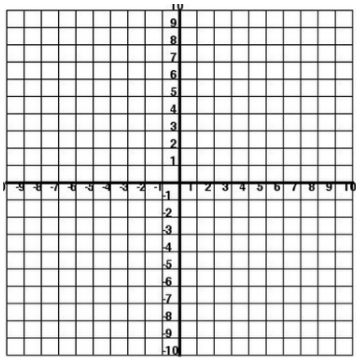
Ex.  $y \geq 3\sqrt{x + 5}$



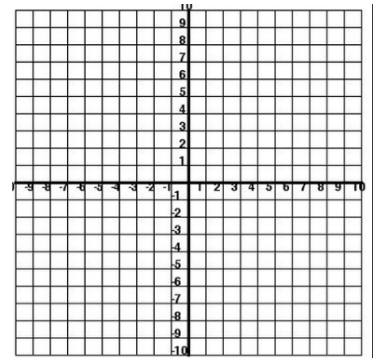
6.  $y > 2\sqrt{x - 1} - 5$



7.  $y < -\sqrt{x + 4} + 3$



8.  $y \geq 6 - 2\sqrt{x - 4}$



### Applications:

The speed of a tsunami is modeled by the equation  $v = 356\sqrt{d}$  where  $v$  equals speed (velocity) in kilometers and  $d$  = depth of the water. If a tsunami is clocked at 145 km/hour, how deep is the water?

Kinetic energy of an object is measured in joules and is modeled by the formula  $E = 0.5mv^2$ . Solve the formula for velocity.