7.9. Advanced Algebra

DATE: 5/30

Graphing Radical Equations

Target 10D. Graph and state the domain and range of radical functions in $f(x) = a\sqrt{x-h}+k$ *form.*

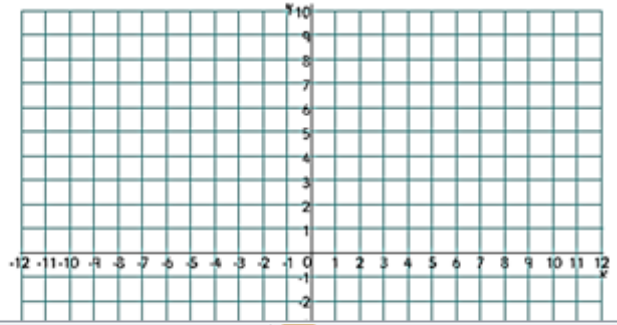
Graphing Radical Functions

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

- "reference point" is (h,k)
- "h" shifts the graph left and right
- "k" shifts the graph up and down
- "a" compresses and stretches the graph
  - $a > 1$ → compresses
  - $a < 1$ → stretches

Graph each radical function by creating a table of values. State the domain and range of each function.

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



Graph each radical function by creating a table of values. State the domain and range of each function.

$y = \sqrt{x}$

$\sqrt{0} = 0$
$\sqrt{1} = 1$
$\sqrt{4} = 2$
$\sqrt{9} = 3$

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

Table

x	$f(x) = y$
0	0
1	1
4	2
9	3

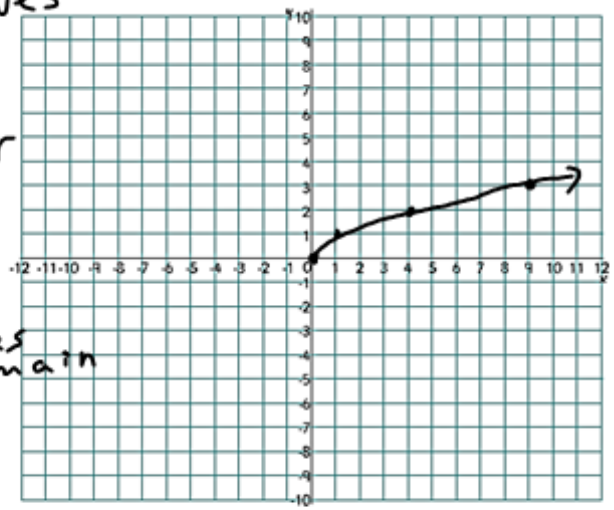
Input Output

Domain: Look under radical. → set of x-values

$D = \{ x \mid x \geq 0 \}$ → such that

Range: → set of y-values based on domain

$R = \{ y \mid y \geq 0 \}$



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

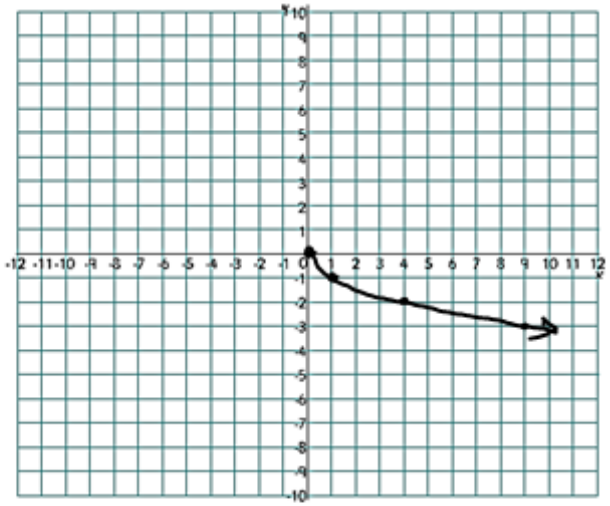
x	y
0	0
1	−1
4	−2
9	−3

Domain:

$D = \{ x \mid x \geq 0 \}$

Range:

$R = \{ y \mid y \leq 0 \}$



3. $f(x) = \frac{1}{2}\sqrt{x-2} + 3$

x	y
2	3
6	4
11	4.5

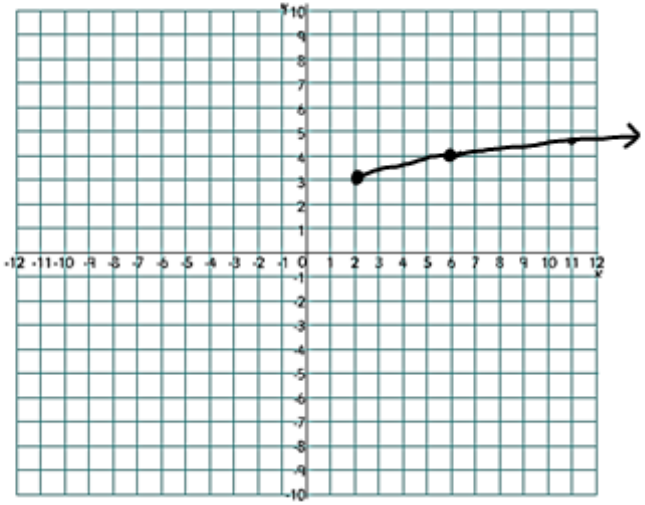
Domain:

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

$D = \{x \mid x \geq 2\}$

Range:

$R = \{y \mid y \geq 3\}$



4. $f(x) = 2\sqrt{x+3} - 1$

x	y
-3	$2\sqrt{-3+3} - 1 = -1$
-2	1
1	3
6	5

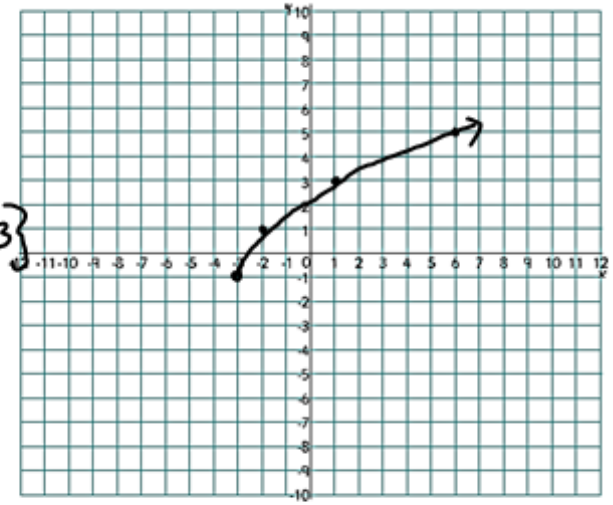
Domain:

$x + 3 \geq 0$
$-3 \quad -3$
$x \geq -3$

$D = \{x \mid x \geq -3\}$

Range:

$\{y \mid y \geq -1\}$



5. $f(x) = \sqrt[3]{x+4} - 1$