

4.1 RADICALS

Note Title

GRAPHING RADICALS IN THE FORM: $y = a\sqrt{b(x-h)} + k$

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① Sketch each graph by mapping points and state the domain and range

a) $y = 2\sqrt{-(x+1)}$

C - Vert. Exp $\times 2$

R - y-axis

T - left 1

$(x, y) \rightarrow (-x-1, 2y)$



$y = \sqrt{x}$

x	y
0	0
1	1
4	2
9	3

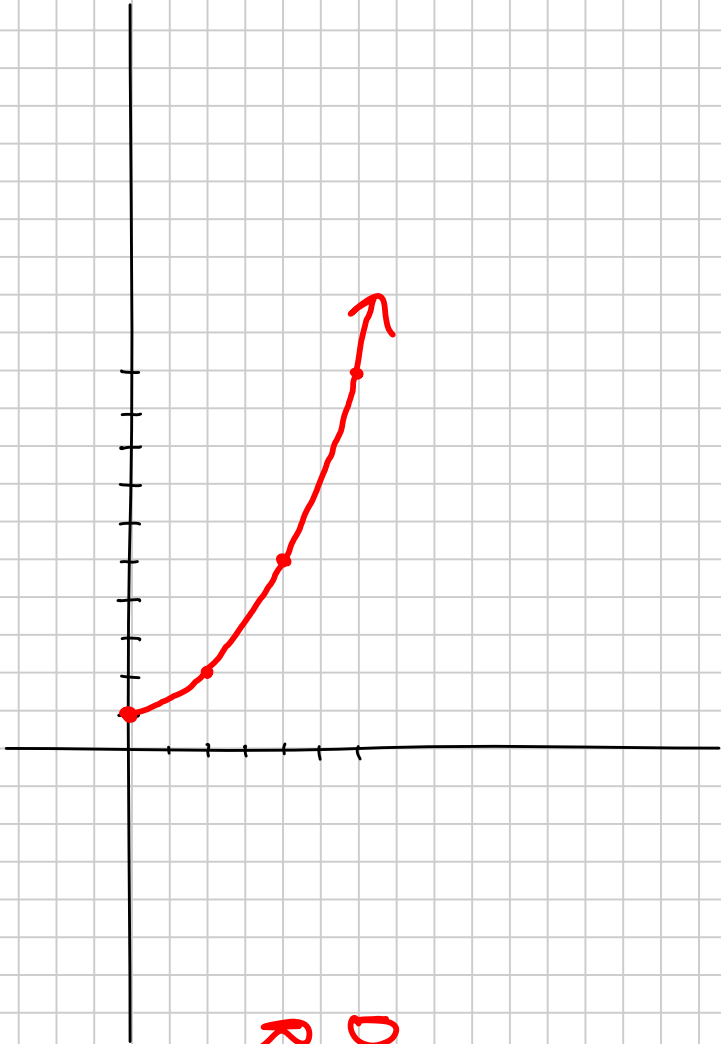


$y = 2\sqrt{-(x+1)}$

x	y
-1	0
-2	2
-5	4
-10	6

$$y = 2\sqrt{-(x+1)}$$

x	y
-1	0
-2	2
-5	4
-10	6



$$D: x \leq -1$$

$$R: y \geq 0$$

$$b) y = 3\sqrt{-x+4} - 2$$

$$* \text{FACTOR } y = 3\sqrt{-(x-4)} - 2$$

C - Vert Exp x 3

R - y-axis

T - Right 4, Down 2

$$(x, y) \rightarrow (-x+4, 3y-2)$$

$$y = \sqrt{x}$$

x	y
0	0
1	1
4	2
9	3

→

$$y = 3\sqrt{-(x-4)} - 2$$

x	y
4	-2
3	1
0	4
-5	7

$$y = 3\sqrt{-(x-4)} - 2$$

x	y
4	-2
3	1
0	4
-5	7

$$D: x \leq 4$$

$$R: y \geq -2$$

$$D: \sqrt{-x+4}$$

Basic Function

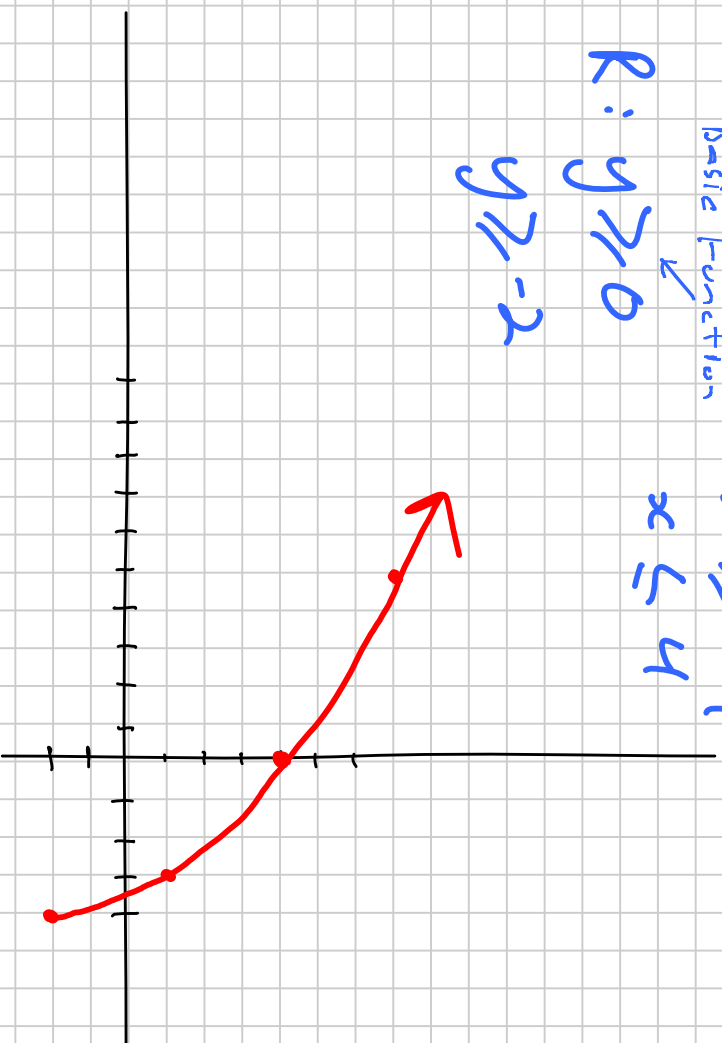
$$R: y \geq 0$$

$$y \geq -2$$

$$-x+4 \geq 0$$

$$-x \geq -4$$

$$x \leq 4$$



② State the domain & range

a) $y = \sqrt{x-3}$

D: $x \geq 0$

R: $y \geq -3$

b) $y = -\sqrt{3x+2} + 1$

$3x+2 \geq 0$

$3x \geq -2$

$x \geq -\frac{2}{3}$

D: $x \geq -\frac{2}{3}$

R: $y \leq 1$

c) $y = \sqrt[3]{x+2}$

D: $x \in \mathbb{R}$

R: $y \in \mathbb{R}$

$$d) y = \sqrt{\frac{1}{2}x^2 - 2}$$

$$\frac{1}{2}x^2 - 2 \geq 0$$

$$\frac{1}{2}x^2 \geq 2$$

$$x^2 \geq 4$$

$$x \geq 2, x \leq -2$$

$$D: x \geq 2, x \leq -2$$

$$R: y \geq 0$$

→ * If $x^2 < 4$ $-2 < x < 2$

$$e) y = -\sqrt{x^3 - 27}$$

$$x^3 - 27 \geq 0$$

$$x^3 \geq 27$$

$$x \geq 3$$

$$D: x \geq 3$$

$$R: y \leq 0$$

③ Graph $f(x) = 9 - x^2$ and $y = \sqrt{f(x)}$. State the domain and range for each function.

x	y	\sqrt{y}
-4	-7	\emptyset
-3	0	0
-2	5	2.2
-1	8	2.8
0	9	3
1	8	2.8
2	5	2.2
3	0	0
4	-7	\emptyset

