480/81
Day 7
Notes

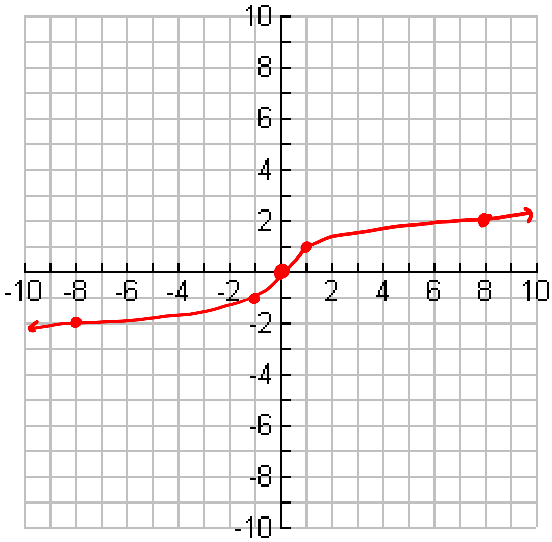
GRAPHING CUBE ROOT FUNCTIONS

OBJECTIVES:

1) Graph cube root functions by translating the mother function.

GRAPHS OF CUBE ROOT FUNCTIONS

Let's first take a look at the mother function $y = \sqrt[3]{x}$.



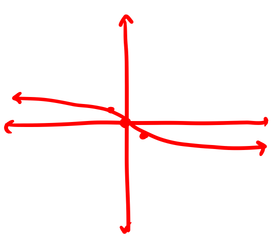
x	y
-8	-2
-1	-1
0	0
1	1
8	2

Domain: $\mathbb{R}$ Range: $\mathbb{R}$

Turning point: (0,0)

Now let's translate a few of these graphs. We're just going to provide a sketch.

a. $y = -\sqrt[3]{x}$

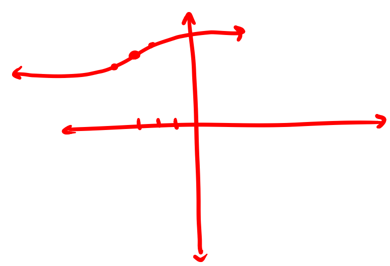


D: $\mathbb{R}$

R: $\mathbb{R}$

Point: (0,0)

b. $y = \sqrt[3]{x+3} + 5$

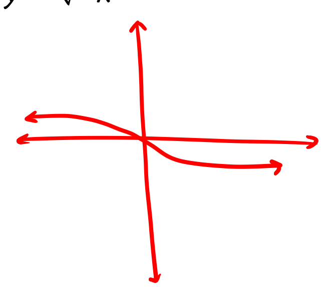


D: $\mathbb{R}$

R: $\mathbb{R}$

Point: (-3,5)

c. $y = \sqrt[3]{-x}$

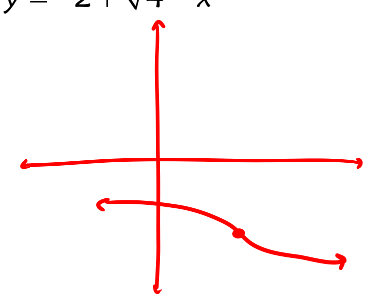


D: $\mathbb{R}$

R: $\mathbb{R}$

Point: (0,0)

d. $y = -2 + \sqrt[3]{4-x}$

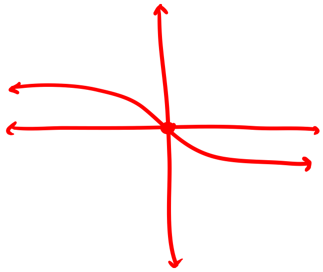


D: $\mathbb{R}$

R: $\mathbb{R}$

Point: (4,-2)

e. $y = -\sqrt[3]{x}$

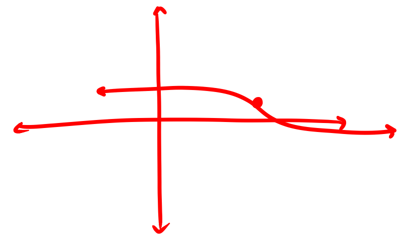


D: $\mathbb{R}$

R: $\mathbb{R}$

Endpoint: $(0,0)$

f. $y = 5 - \sqrt[3]{x-1}$

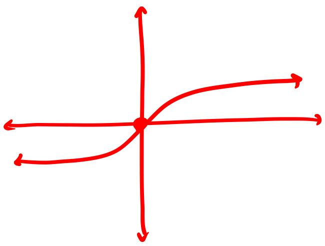


D: $\mathbb{R}$

R: $\mathbb{R}$

Endpoint: $(1,5)$

e. $y = -\sqrt[3]{-x}$

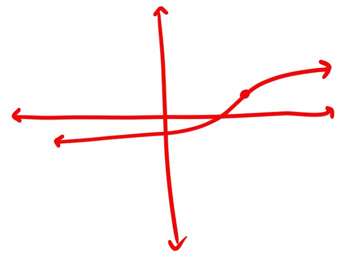


D: $\mathbb{R}$

R: $\mathbb{R}$

Endpoint: $(0,0)$

f. $y = 5 - \sqrt[3]{1-x}$



D: $\mathbb{R}$

R: $\mathbb{R}$

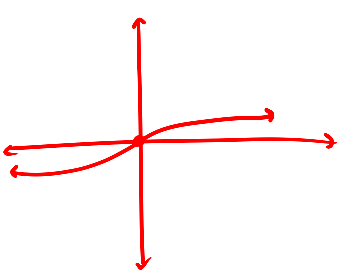
Endpoint: $(1,5)$

CONCLUSIONS:

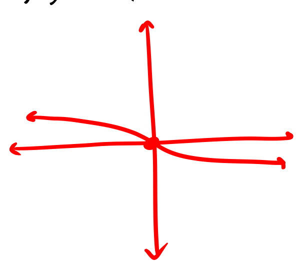
- $y = k + \sqrt[3]{x-h}$ has a turning point (h,k), domain $\mathbb{R}$ and range $\mathbb{R}$.
- $y = k - \sqrt[3]{x-h}$ has a turning point (h,k), domain $\mathbb{R}$ and range $\mathbb{R}$.
- $y = k + \sqrt[3]{h-x}$ has a turning point (h,k), domain $\mathbb{R}$ and range $\mathbb{R}$.
- $y = k - \sqrt[3]{h-x}$ has a turning point (h,k), domain $\mathbb{R}$ and range $\mathbb{R}$.

General sketches:

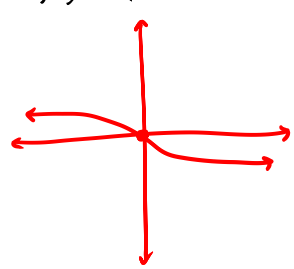
1) $y = \sqrt[3]{x}$



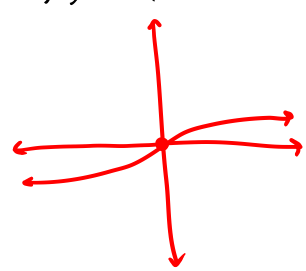
2) $y = -\sqrt[3]{x}$



3) $y = \sqrt[3]{-x}$



4) $y = -\sqrt[3]{-x}$



5) Write the equation of an irrational function that has a turning point (3,5) and domain of all real numbers.

$y = 5 + \sqrt[3]{x-3}$ OR $y = 5 - \sqrt[3]{x-3}$

6) Write a DIFFERENT irrational function with the **same graph** as the problem above.

$y = 5 - \sqrt[3]{3-x}$ OR $y = 5 + \sqrt[3]{3-x}$