

DO NOW

How do you find a root on a graph?

x-intercepts

How many roots does a linear equation have?

1

How many roots does a quadratic equation have?

2

Page 1

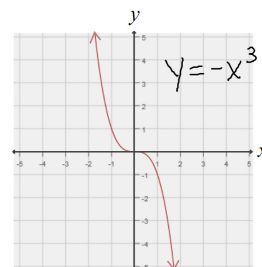
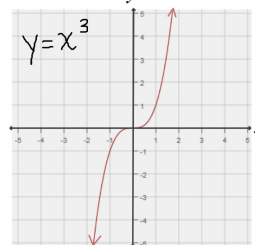
8.11 Cubic and Root Functions

cubic function: degree of 3 (highest exponent)

If $a > 0$ * Goes up L → R

If $a < 0$ * Goes down L → R

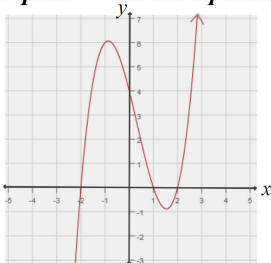
Parent Function



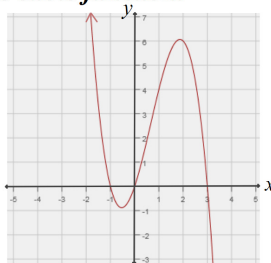
Page 2

Examples: Write the equation for the cubic function.

1.



2.



$$\begin{aligned} x &= -2 & x &= 1 & x &= 2 \\ x+2 &= 0 & \text{OR } x-1 &= 0 & \text{OR } x-2 &= 0 \\ (x+2)(x-1)(x-2) &= 0 \\ (x^2-x+2x-2)(x-2) &= 0 \\ x^3-2x^2-x^2+2x+2x^2-4x-2x+4 &= 0 \\ x^3-x^2-4x+4 &= 0 \\ \boxed{y = x^3 - x^2 - 4x + 4} \end{aligned}$$

$$\begin{aligned} x &= -1 & x &= 0 & x &= 3 \\ x+1 &= 0 & \text{OR } x &= 0 & \text{OR } x-3 &= 0 \\ -(x+1)(x)(x-3) &= 0 \\ (-x^2-x)(x-3) &= 0 \\ -x^3+3x^2-x^2+3x &= 0 \\ -x^3+2x^2+3x &= 0 \\ \boxed{y = -x^3 + 2x^2 + 3x} \end{aligned}$$

Page 3

Root Functions

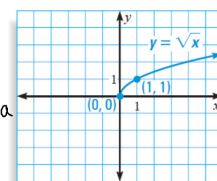
1. Square Root $y = \sqrt{x}$

* Know basic shape

* half of a sideways parabola

* Domain $x \geq 0$

Range $y \geq 0$



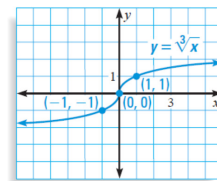
Domain: $x \geq 0$, Range: $y \geq 0$

2. Cubed Root $y = \sqrt[3]{x}$

* Know basic shape

* a stretched S

* domain: all reals
range: all reals



Domain and range: all real numbers

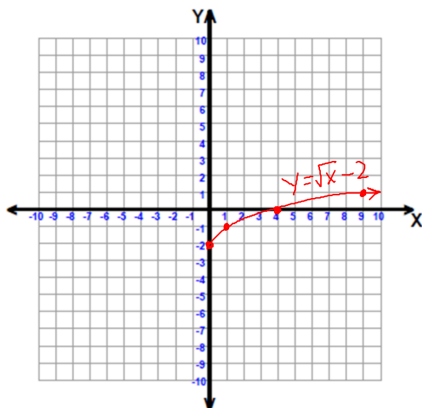
Page 4

To graph root functions: use the calculator

Put table of integer values to graph

Graph: $y = \sqrt{x} - 2$

x	y
0	-2
1	-1
4	0
9	1



Page 5

HOMEWORK

Worksheet - HW 8.11

Page 6