

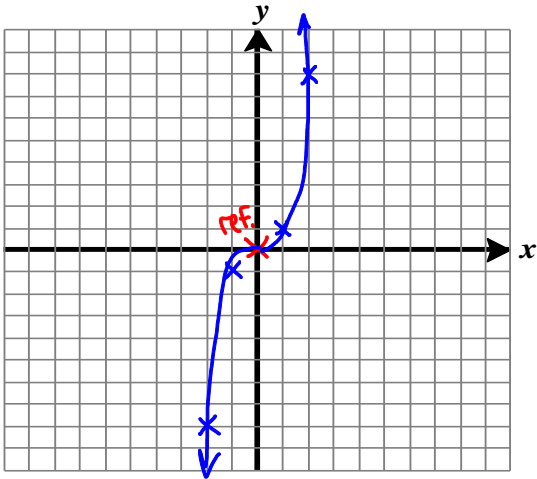
Pre-AP Algebra II
Notes Day # 93-94
Graphing Cubic Functions & Cube Roots

Directions: Graph the original cubic parent function and compare it to a cube root

Ex. 1: $y = x^3$ [Cubic parent function]

$y = a(b(x-h))^3 + k$ [Transformation Equation]

Cubic Graph, $f(x)$



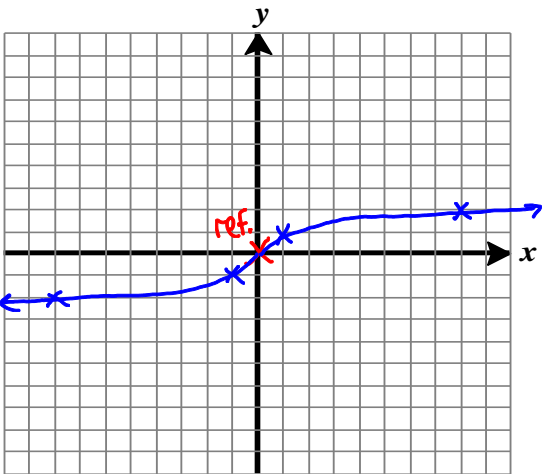
x	y
-2	-8
-1	-1
0	0
1	1
2	8

reference point ←

Ex.2: $y = \sqrt[3]{x}$ [Cube root parent function]

$y = a\sqrt[3]{b(x-h)} + k$ [Transformation Equation]

Cube Root Graph, $f^{-1}(x)$



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

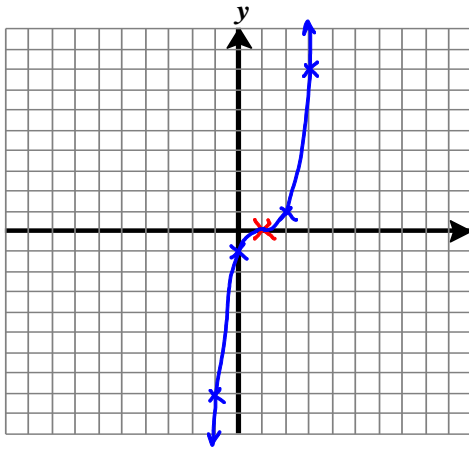
reference point ←

What do you notice about the relationship between these two graphs?

The x and y -values are swapped, so they are inverses of each other.

Directions: Graph the following functions. ~~State the Domain and Range.~~

Ex. 3: $y = (x-1)^3$
Right + 1

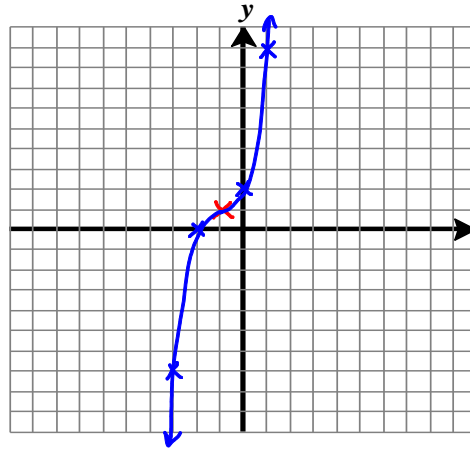


Domain:

Range:

Ex. 4: $y-1 = (x+1)^3$
 $\frac{+1}{+1}$
 $y = (x+1)^3 + 1$

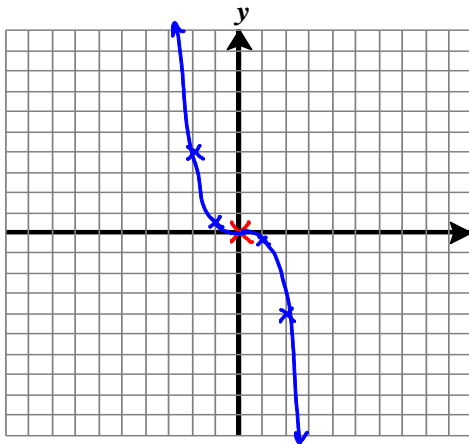
*• Left + 1
 • up 1*



Domain:

Range:

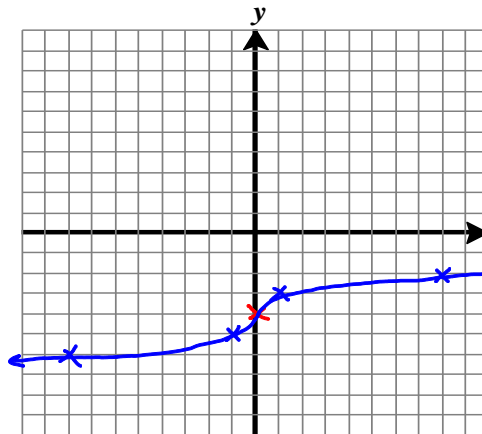
Ex. 5: $y = -\frac{1}{2}x^3$
*• Reflection over x-axis
 • Vertical compression by a factor of 1/2*



Domain:

Range:

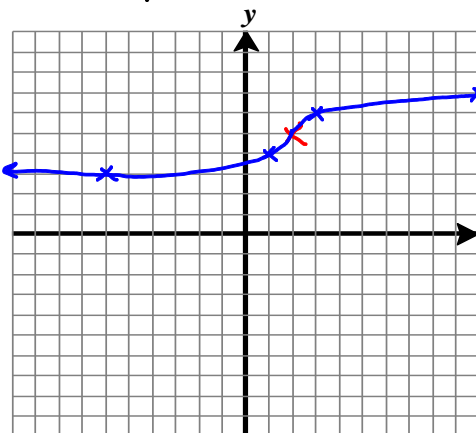
Ex. 6: $y = \sqrt[3]{x} - 4$
down 4



Domain:

Range:

Ex. 7: $y-5 = \sqrt[3]{x-2}$
 $\frac{+5}{+5}$
 $y = \sqrt[3]{x-2} + 5$
*• Right + 2
 • up 5*

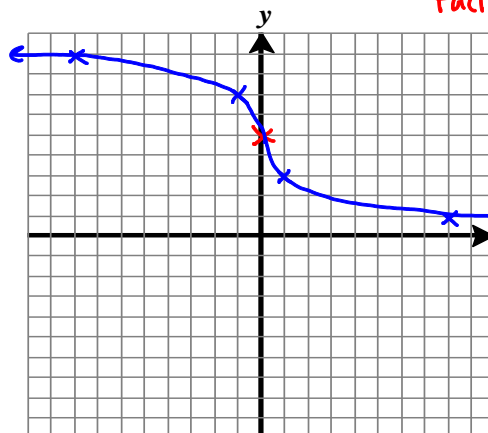


Domain:

Range:

Ex. 8: $y = -2\sqrt[3]{x} + 5$

*• up 5
 • Reflection over x-axis
 • Vertical stretch by a factor of 2*



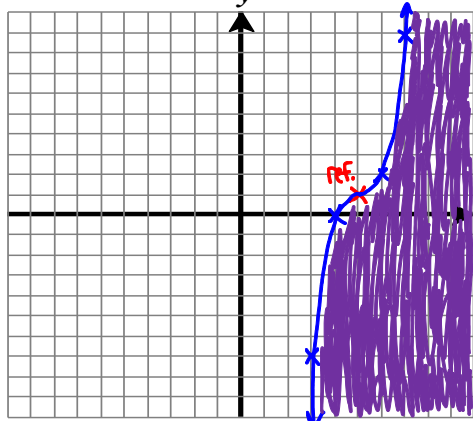
Domain:

Range:

Directions: Graph the following inequalities.

Ex. 9: $y \leq (x-5)^3 + 1$

solid, shade below
• Right 5
• up 1

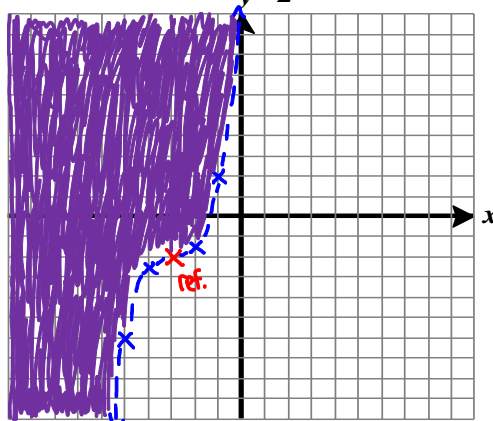


Domain:

Range:

Ex. 10: $y \geq \frac{1}{2}(x+3)^3 - 2$

dashed, shade above

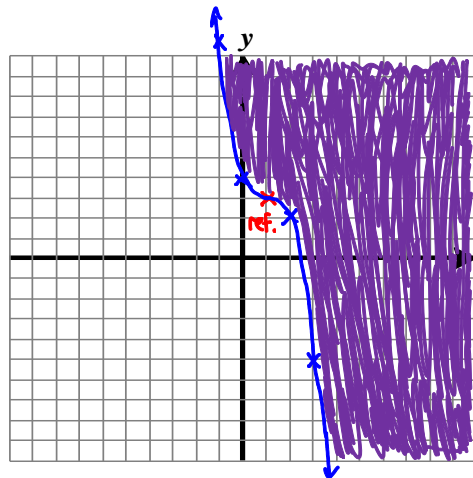


Domain:

Range:

Ex. 11: $y \geq -(x-1)^3 + 3$

solid, shade above
• Right 1
• up 3
• Reflection over x-axis

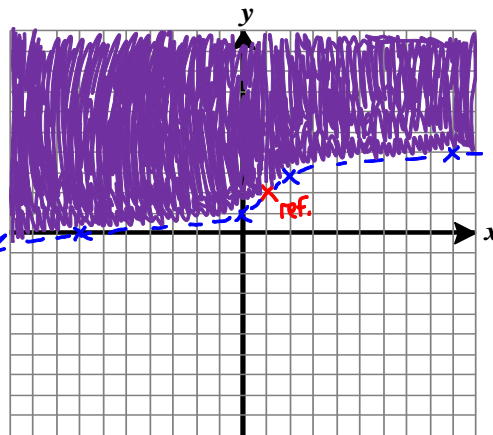


Domain:

Range:

Ex. 12: $y \geq \sqrt[3]{x-1} + 2$

dashed, shade above
• Right 1
• up 2

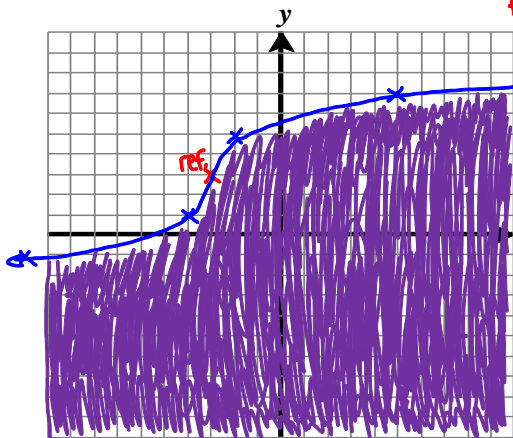


Domain:

Range:

Ex. 13: $y \leq 2\sqrt[3]{x+3} + 3$

solid, shade below
• Left 3
• up 3
• Vertical stretch by a factor of 2

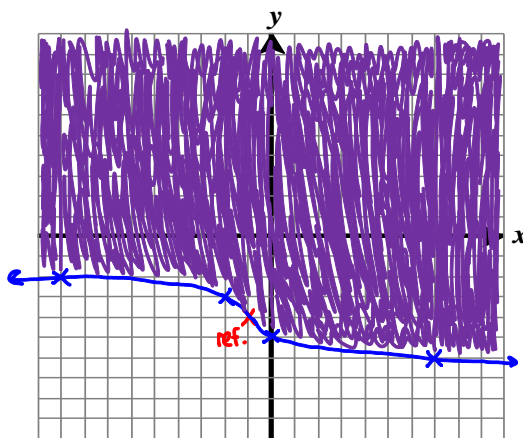


Domain:

Range:

Ex. 14: $y \geq -\sqrt[3]{x+1} - 4$

solid, shade above
• Left 1
• down 4
• Reflection over x-axis



Domain:

Range: