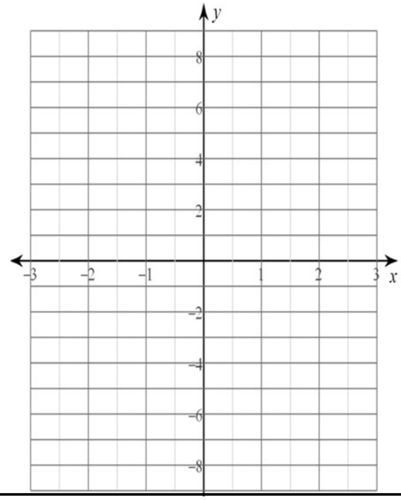
SM3-A Lesson 1-5 (Cube Function) $f(x) = x^3$

Fill in the table, graph the points.

x	y
-2	-8
-1	
0	
1	
2	

$y = (-2)^3$



Domain of the function?

$x = (\_\_\_\_, \_\_\_\_)$

Range of the graph?

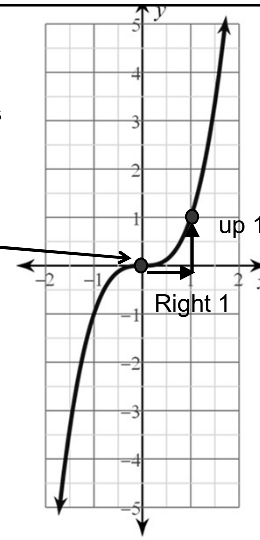
$y = (\_\_\_\_, \_\_\_\_)$

$f(x) = x^3$

Inflection Point: the point where the shape of the graph changes from "concave down" (curving downward) to "concave up" (curving upward) or vice versa.

Inflection point: (____, ____)

Shape of the graph: Not vertically stretched: from the inflection point "right 1, up 1"

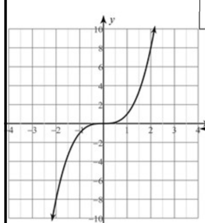


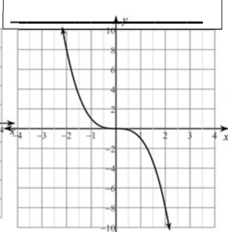
Left/right and up/down transformations move the inflection point (and the whole graph)

Reflection across the x-axis and vertical stretching affects the shape of the graph.

Describe the transformations:

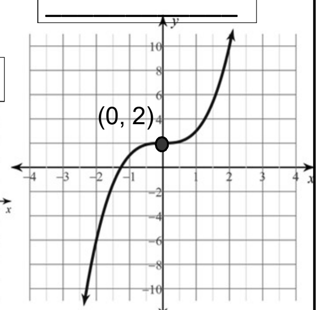
$f(x) = x^3$ $g(x) = -x^3$ ________________





Inflection point ______________________.

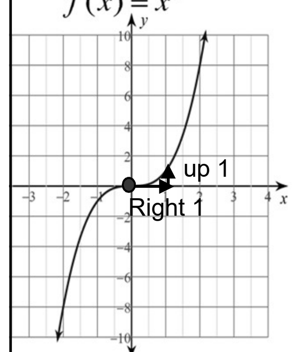
$k(x) = x^3 + 2$ ________________

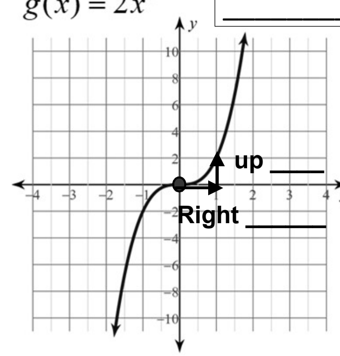


Inflection point ______________________

Describe the transformations of the parent function given by:

$f(x) = x^3$ $g(x) = 2x^3$ ________________



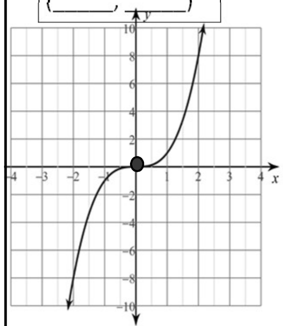


Inflection point ______, shape is ___________

Where is the inflection point?

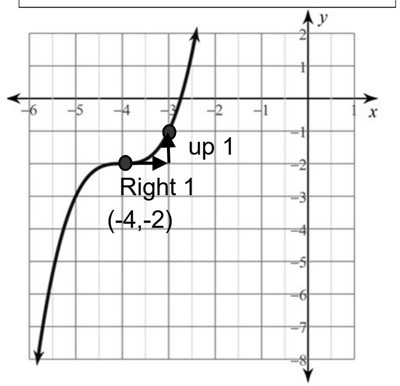
$f(x) = x^3$

(_____, _____)

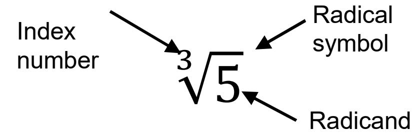


$\text{j}(x) = (x+4)^3 - 2$

____



Cubed Root (or 3rd root)



Some number equals the cubed root of 5.

$x = \sqrt[3]{5}$

Use the <u>property of equality</u> to "cube" the left and right side of the equal sign results in an <u>equivalent equation.</u>

$(x)^3 = \left(\sqrt[3]{5}\right)^3$

$x^3 = 5$

$\sqrt[3]{5}$ means "what number cubed equals 5"

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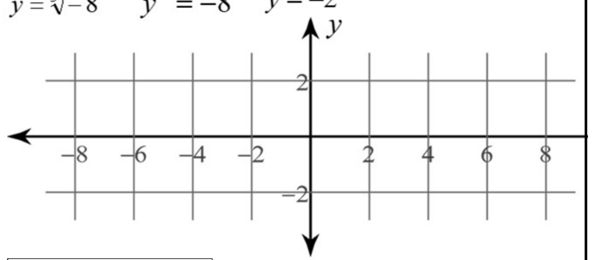
Cubed Root function: $f(x) = \sqrt[3]{x}$

Fill in the output values of the table, then graph the points.

x	y
-8	-2
-1	
0	
1	
8	

$y = \sqrt[3]{-8}$ $y^3 = -8$ $y = -2$

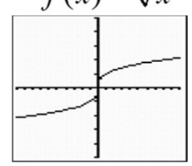


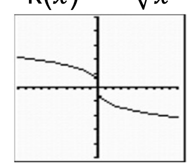
domain? ____________

range? ____________

What is the transformation of the parent function?

$f(x) = \sqrt[3]{x}$ $\text{k}(x) = -\sqrt[3]{x}$ $\text{g}(x) = -2 + \sqrt[3]{x+4}$





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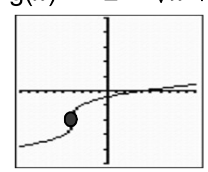

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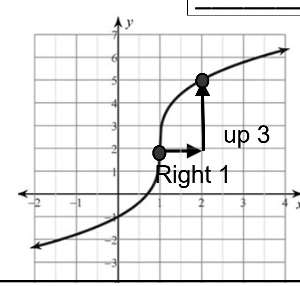
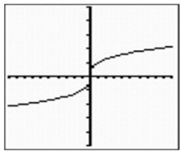


$\text{j}(x) = 3\sqrt[3]{x-1} + 2$

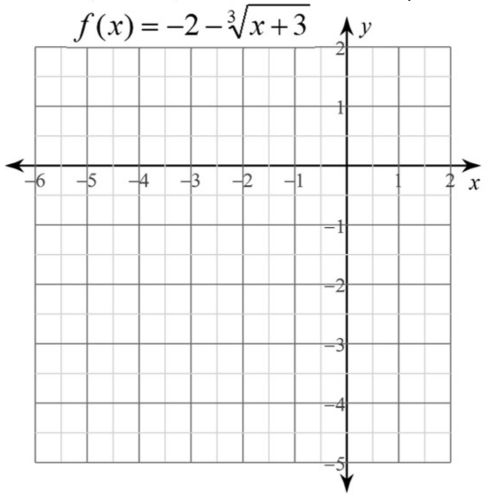
____

$f(x) = \sqrt[3]{x}$



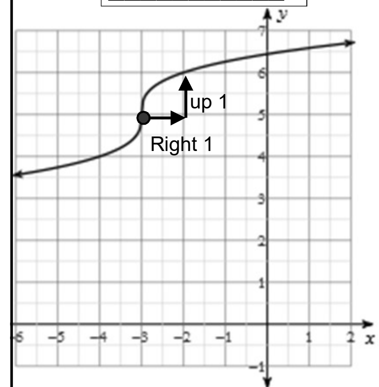
Graph the (without a calculator).

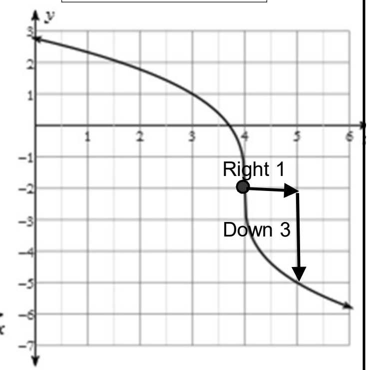
$f(x) = -2 - \sqrt[3]{x+3}$



What is the equation of the graph?

______________ ______________





What is the equation of the graph?

______________ ______________