Exercise 75

For the following exercises, describe how the formula is a transformation of a toolkit function. Then sketch a graph of the transformation.

$$p(x) = \left(\frac{1}{3}x\right)^3 - 3$$

Solution

Start with the parent function.

$$x^3$$

Replacing x with $(1/3)x$ horizontally stretches the graph by a factor of 3.

$$\left(\frac{1}{3}x\right)^3$$

Subtracting 3 from the function shifts the graph down by 3 units.

$$\left(\frac{1}{3}x\right)^3 - 3$$