

## Model Card

**Learning Target:** Produce the inverse function of a given original function by solving for  $x$ .

### Work/ Process

### Reasoning/Justification

Original Function: ~~g(x)~~  
 $g(x) = 2(x+3)^3$

$$\frac{g(x)}{2} = \frac{2(x+3)^3}{2}$$

$$\sqrt[3]{\frac{g(x)}{2}} = \sqrt[3]{(x+3)^3}$$

$$\sqrt[3]{\frac{g(x)}{2}} = x+3$$

-3

$$\sqrt[3]{\frac{g(x)}{2}} - 3 = x$$

$$g^{-1}(x) = \sqrt[3]{\frac{x}{2}} - 3$$

Solving for  $x$  to flip the equation "inside out"  
 → divide by 2 on both sides because that is the opposite of multiplying by 2.

→ take the cubed root of both sides to "undo" the exponent 3. B/c  $\sqrt[3]{\quad}$  is the opposite of  $x^3$

→ Subtract 3 on both sides because that is the opposite of "+3". -3 will stay outside the radical  $\sqrt[3]{\quad}$  b/c we already took the root.

→ rewrite the final expression with inverse notation (symbol  $g^{-1}(x)$ )