

OPENER:

Have out the 5.2 w.s. to correct.

Login your clickers.

Answer the 5.2 checkpoint on the brown table.

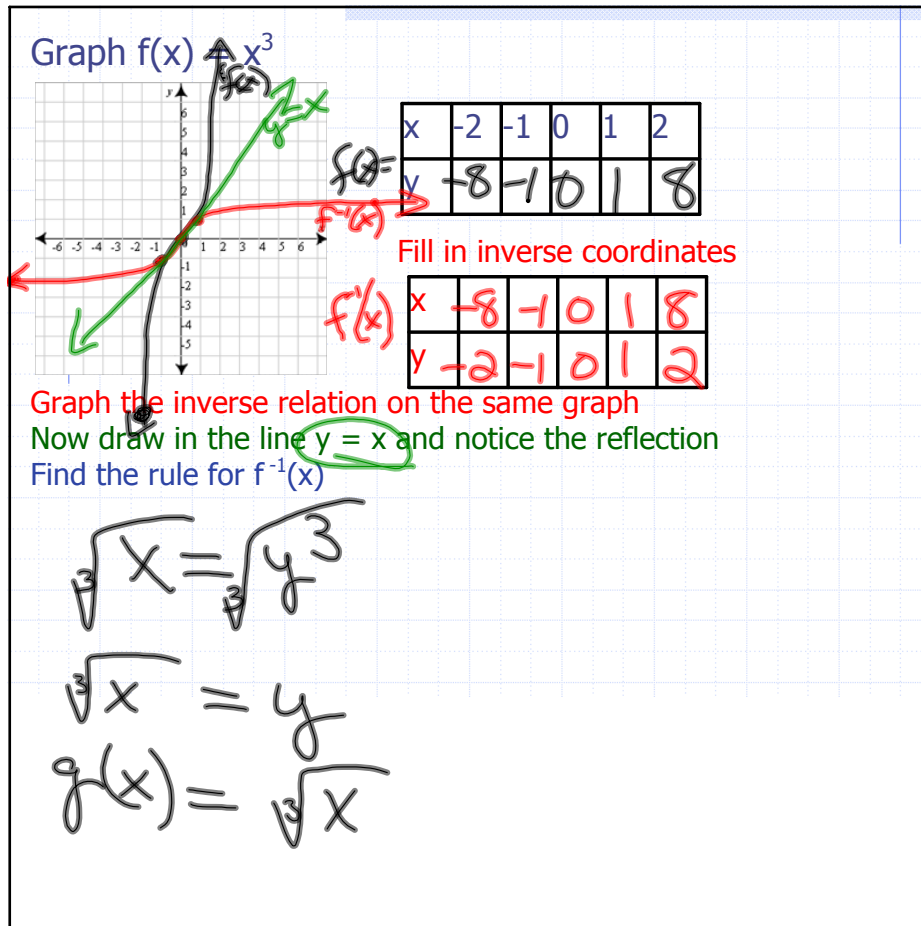
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Algebra 2 Section 5-3

Inverses of Cubic Functions

$$X^3 \Rightarrow \sqrt[3]{X}$$

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Cube Root Functions

- As you discovered on the last problem, the inverse of a cubic function is a cube root function
- Cube root functions look like cubic functions turned sideways

Example

- Find the inverse of $f(x) = 0.5x^3$, then graph both functions on the same graph

$$2x = \left(\frac{1}{2}x^3\right) \cdot 2$$

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

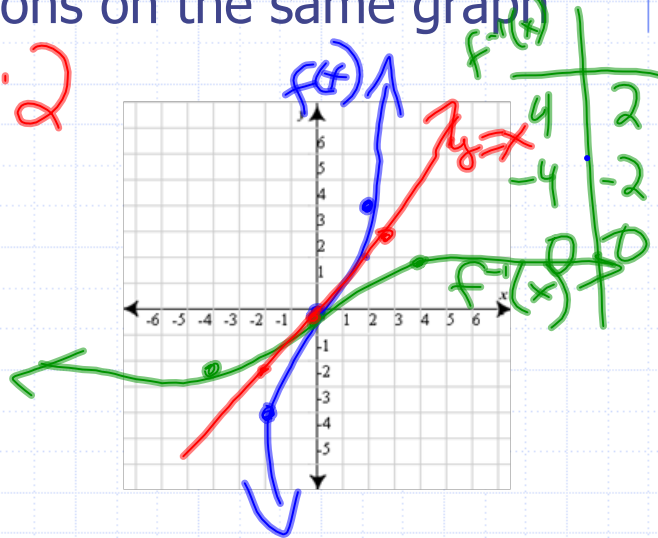
$$y = \sqrt[3]{2x}$$

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

$$\frac{1}{2}x^3 = y$$

$$x^3 = 2y$$

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



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Pike

The function $w(L) = L^3/3500$ gives the approximate weight in pounds of a pike with length L inches.

Write and graph the inverse function $l(w)$ to find the approximate length L in inches of a pike weighing w pounds.

$w = \text{weight}$ $L = \text{length}$

$$3500w = \frac{L^3}{3500}$$

$$\sqrt[3]{3500w} = \sqrt[3]{\frac{L^3}{3500}}$$

$$L = \sqrt[3]{3500w}$$

- Use the inverse function to find how long a 7-pound pike would be.

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Reflect

- How could you check to see if your inverse is correct? *Plug the answer from the inverse into the original problem.*
- What is the significance of the point $(6,28)$ on your graph? *6 inches + 28 pounds*
- What are the reasonable domain and range of the inverse function?

$$D: x \in \mathbb{R} \quad x > 0$$
$$R: y \in \mathbb{R} \quad y > 0$$

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GUIDED PRACTICE

Find the inverse of the given function. Then verify or check that your result and the original function are inverses.

1. $f(x) = -3x^3$

2. $f(x) = \frac{1}{4}x^3$

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① Complete Pp.
181-182 1-800 (6)

② Quiz Review

③ P. 5.3 W. 5.

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