

3.4 Inverse Applications

Unit 3
Day 4

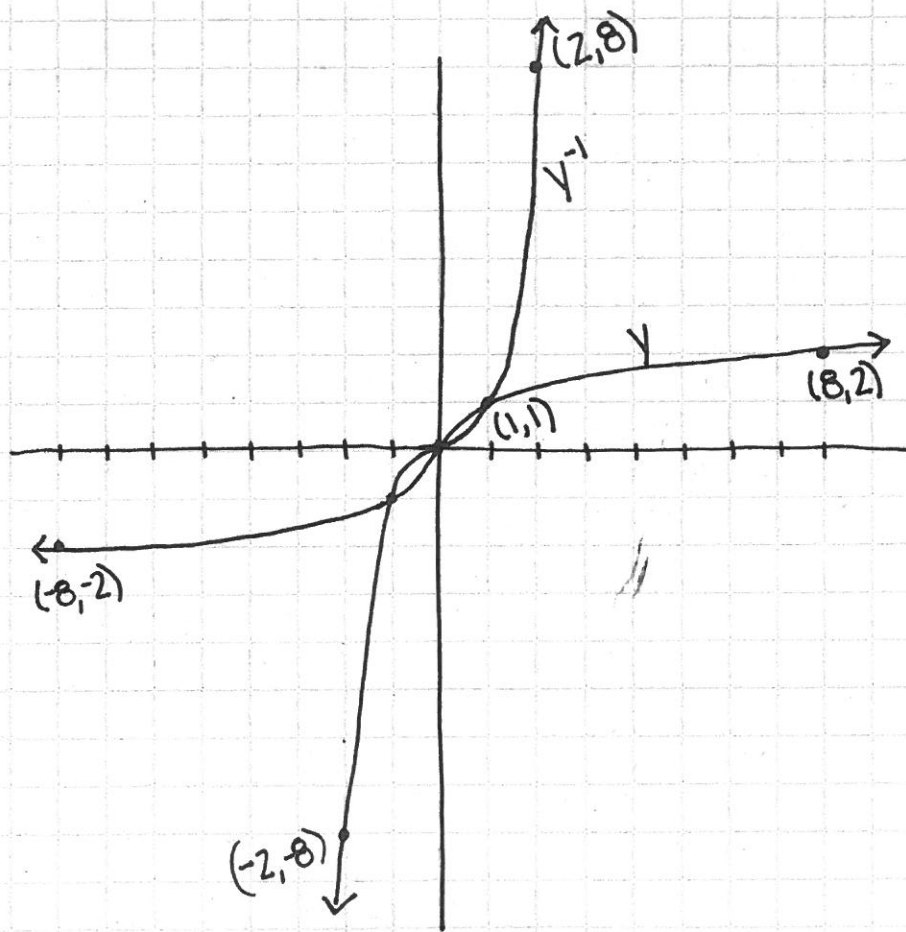
Inverse function of y is y^{-1}
of $f(x)$ is $f^{-1}(x)$

Inverse: switch $x \leftrightarrow y$ *domain \leftrightarrow range switch*

Inverse: Reflect original graph over $y=x$

Ex: The inverse of the point $(-3, 5)$ is $(5, -3)$

Ex: Graph $y = \sqrt[3]{x}$. Use transformations to graph y^{-1} .



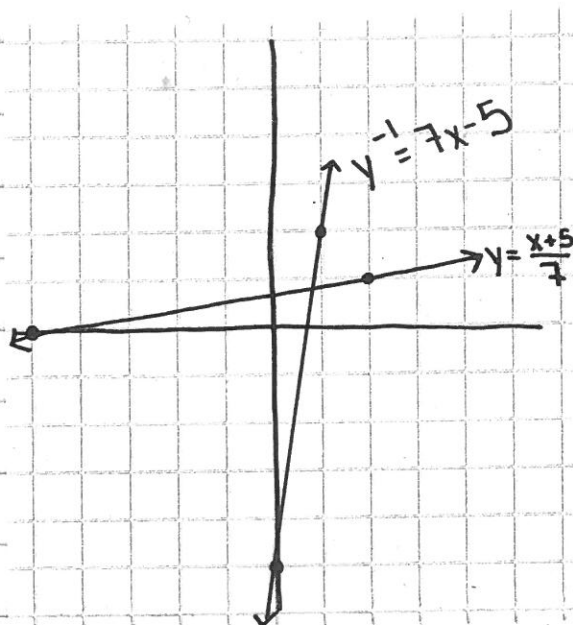
$$y^{-1} = x^3$$

Ex. Given $y = \frac{x+5}{7}$, find y^{-1} . Graph both.

$$x = \frac{y+5}{7} \text{ switch } x \text{ \& } y.$$

$$7x = y+5 \text{ solve for } y.$$

$$7x-5 = y^{-1}$$



You try: find the inverse of:

① $y = x^3 + 2$

② $y = 2x - 7$

③ $y = \frac{x}{2} + 5$

④ $y = 3(x-4)$

⑤ $y = \frac{2}{3}x - \frac{5}{7}$

⑥ $y = \sqrt[3]{x-1}$

① $y^{-1} = \sqrt[3]{x-2}$

④ $y^{-1} = \frac{x}{3} + 4$

② $y^{-1} = \frac{1}{2}(x+7)$

⑤ $y^{-1} = \frac{3}{2}(x + \frac{5}{7})$

③ $y^{-1} = 2(x-5)$

⑥ $y^{-1} = x^3 + 1$