

Ex: If $f(x) = x^3 - 4$ and $g(x) = \sqrt[3]{x-4}$.

Is $g = f^{-1}$?

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

$$= (\sqrt[3]{x-4})^3 - 4$$

$$= x - 4 - 4 = x - 8 \neq x$$

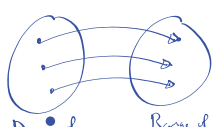
$f(x) = x^3 - 4$; $g(x) = \sqrt[3]{x-4}$

$$f(g(x)) = f(\sqrt[3]{x-4}) = (\sqrt[3]{x-4})^3 - 4 = x - 4 - 4 = x - 8$$

$$g(f(x)) = g(x^3 - 4) = \sqrt[3]{x^3 - 4 - 4} = \sqrt[3]{x^3 - 8} = x - 2$$

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Find the domain and range of the inverse function

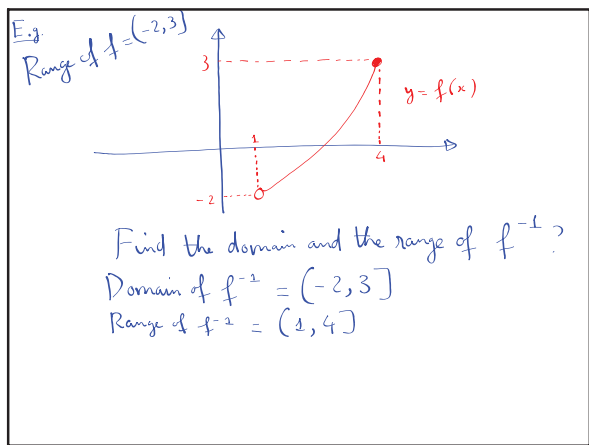


Domain of $f^{-1} = \text{Range of } f$
Range of $f^{-1} = \text{Domain of } f$

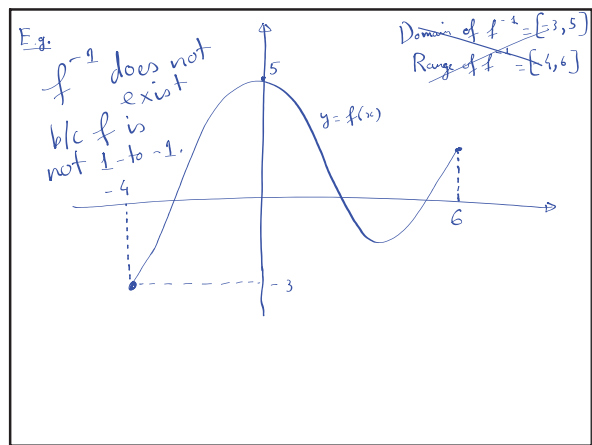
E.g. $f = \{(1, 2), (3, 5), (-7, 12)\}$

Domain of $f = \{1, 3, -7\}$ • Domain of $f^{-1} = \{2, 5, 12\}$
Range of $f = \{2, 5, 12\}$ • Range of $f^{-1} = \{1, 3, -7\}$

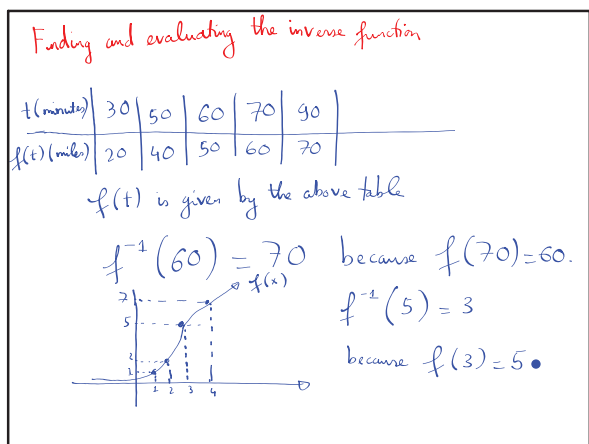
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Find the formula of the inverse function.

$f(x) = \frac{1}{3}(x-5)$. Find the formula for $f^{-1}(x)$

$y = \frac{1}{3}(x-5)$ To solve for x .

$$\frac{y}{\frac{1}{3}} = x - 5$$

$$3y = x - 5$$

$$x = 3y + 5$$

Interchange x and y .

$$f^{-1}(x) = 3x + 5$$

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