

17  $f(y) = \frac{y+3}{y-2} \quad X \neq 2$

$$y+2 \cdot X = \frac{y+3}{y-2} \cdot y-2$$

$$(y-2)x = y+3$$

$$\begin{array}{r} Xy - 2x = y+3 \\ -3 \quad -3 \end{array}$$

$$\begin{array}{r} Xy - 2x - 3 = y - xy \\ -y \end{array}$$

$$-2x - 3 = y - xy$$

$$\begin{array}{r} -2x - 3 = y(1-x) \\ \frac{-2x-3}{1-x} = \frac{y(1-x)}{1-x} \end{array}$$

$\frac{-2x-3}{1-x} = y \quad X \neq 2, X \neq 1$

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18  $f(x) = \sqrt{x+2} \quad X \geq -2$

$$X^2 = \sqrt{y+2}^2$$

$$X^2 = y + \frac{2}{-2}$$

$$X^2 - 2 = y$$

\* new  $X \geq -2 \quad X \geq 2$

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13  $f(x) = 3x - 6$

$$X = 3y - 6$$

$$\begin{array}{r} X + 6 = 3y - 6 \\ +6 \quad +6 \end{array}$$

$$\frac{X+6}{3} = \frac{3y}{3} = y$$

$\frac{X+6}{3} = y$        $\frac{X}{3} + \frac{6}{3} = y$

$\frac{1}{3}X + 2 = y$

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1.5 Part 2

Inverse: Switch x and y  
Solve y

Inherited domain: Use the restriction from f(x) and f'(x) to write D → R of f(x) the domain of f'(x)

R → D of f(x)

$\begin{array}{ccc} D & \rightarrow & D \\ R & \rightarrow & R \end{array}$

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One-to-one function  
both x and y can't repeat

- vertical line test - pass to be onto one
- horizontal line test -  $f^{-1}(y) \rightarrow$  pass/not pass

$f(x)$  not one to one  
one to one function

not a one to one  
 $f^{-1}(x)$  is one to one

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A function and its inverse must be

$$f(g(x)) = x$$

$$g(f(x)) = x$$

Subbing a function in for another function.

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$$f \circ g(x) = x$$

$$g \circ f(x) = x$$

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

are  $f(x)$  and  $g(x)$  inverses

$$f(g(x)) = x \quad g(f(x)) = x$$

$$\begin{aligned} (\sqrt[3]{x-1})^3 + 1 &= x \\ (x-1) + 1 &= x \\ x + 0 &= x \\ &\text{yes} \end{aligned}$$

$$\begin{aligned} \sqrt[3]{x-1} &= x \\ \sqrt[3]{x^3 - 1} &= x \\ \sqrt[3]{x^3 + 1 - 1} &= x \\ \sqrt[3]{x^3} &= x \\ &\text{yes} \end{aligned}$$

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$$(31) \quad f(x) = \frac{x+1}{x} \quad g(x) = \frac{1}{x-1}$$

$$f(g(x)) = \frac{(\frac{1}{x-1}) + 1}{(\frac{1}{x-1})}$$

$$= \frac{\cancel{x+1}}{\cancel{x+1}} + \frac{1}{\frac{1}{x-1}}$$

$$= 1 + 1 \cdot \frac{x-1}{1}$$

$$= 1 + (x-1)$$

$$= 1 + x - 1$$

$$= x \quad \text{yes}$$

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$$f(x) = \frac{x+1}{x} \quad g(x) = \frac{1}{x-1}$$

$$g(f(x)) = \frac{1}{(\frac{x+1}{x}) - 1}$$

$$= \frac{1}{(\frac{x+1}{x}) - 1} \cdot \left(\frac{x}{x}\right)$$

$$= \frac{x}{(x+1) - x}$$

$$\frac{x}{1} = x \quad \text{yes}$$

example

$$\frac{3}{2} + 1\left(\frac{2}{2}\right)$$

$$\frac{3}{2} + \frac{2}{2}$$

$$\frac{5}{2}$$

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Fraction Example

$$\frac{(3+2)}{(3)} = \frac{\cancel{3} \cdot 2}{\cancel{3}}$$

$$\frac{3}{3} + \frac{2}{3} = 1 + \frac{2}{3} = \frac{5}{3} = 1\frac{2}{3}$$

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