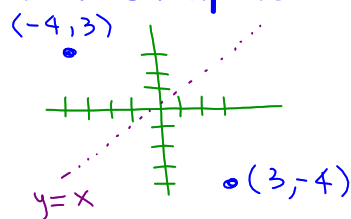


Inverses of Functions + their Graphs

ex) Find the inverse of $(-4, 3)$

switch x with y
 $(3, -4)$



Inverse = the reflection of the function over the line $y = x$
 which we can get by switching x with y for all points

ex) Given $f(x) = 4x + 3$, write an equation for $f^{-1}(x)$.

<u>Step 1</u>	$x = 4y + 3$
switch x and y variables	$x - 3 = 4y$
<u>Step 2</u>	$\frac{x-3}{4} = y$
isolate y	$\frac{x}{4} - \frac{3}{4} = y$
<u>Step 3</u>	
write y as $f^{-1}(x)$	$f^{-1}(x) = \frac{x-3}{4}$

ex) Given $f(x) = \frac{5}{x+2}$, write an equation for $f^{-1}(x)$.

$$y = \frac{5}{x+2}$$

$$\frac{(y+2)x}{x} = \frac{5}{y+2} \cdot \frac{(y+2)}{x}$$

$$y+2 = \frac{5}{x}$$

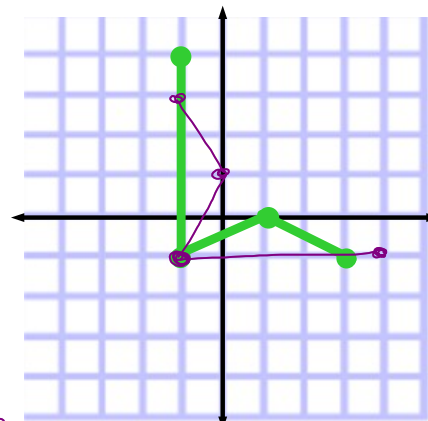
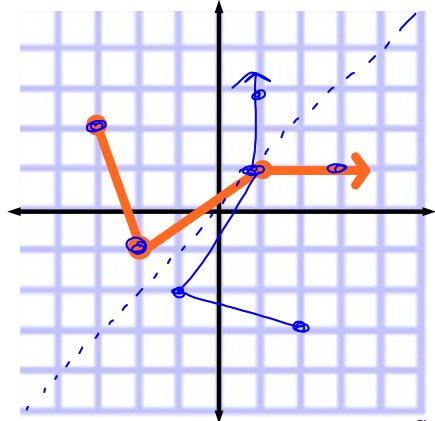
$$y = \frac{5}{x} - 2$$

$$f^{-1}(x) = \frac{5}{x} - 2$$

ex) a) Find $g^{-1}(x)$ given $g(x)$

b) Find $f^{-1}(x)$ given $f(x)$

State the domain and range of each function and its inverse.



$$(x, y) \rightarrow (y, x)$$

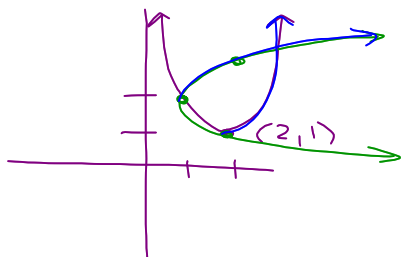
$(-3, 2)$	$(2, -3)$
$(-2, -1)$	$(-1, -2)$
$(1, 1)$	$(1, 1)$
$(3, 1)$	$(1, 3)$

D: $[1, 2]$
R: $[-3, \infty)$

D: $\{x \mid -1 \leq x \leq 4\}$
R: $\{y \mid -1 \leq y \leq 3\}$

ex) Give a restriction for $f(x)$ so that its inverse is a function.

$$f(x) = (x - 2)^2 + 1$$



$x > 2$
or
 $x \leq 2$

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1, 2, 4-8, 11, 12