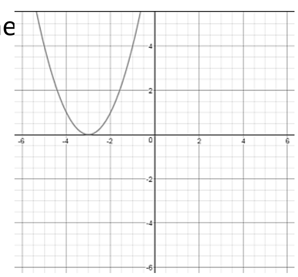
PCFU (B2-B3): Finding Inverses Name:___________________________ Pd:____

Answers with explanations

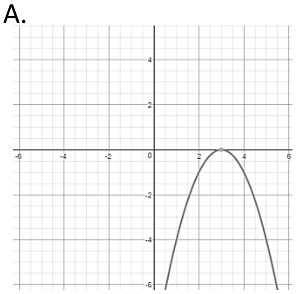
1. Given $f(x) = \sqrt{x+3} - 5$, find $f^{-1}(x)$. Show all of your work. Box your final answer.

First I need to write the function with y = instead of $f(x)$.	$y = \sqrt{x+3} - 5$
Next I will exchange the positions of x and y.	$x = \sqrt{y+3} - 5$
Now I will solve for y.	$x + 5 = \sqrt{y+3} - 5 + 5$
I will add 5 to both sides to isolate the radical.	$x + 5 = \sqrt{y+3}$
Since I'm trying to solve for y, I will square both sides to get rid of the square root.	$(x+5)^2 = (\sqrt{y+3})^2$
	$(x+5)^2 = y + 3$
My last step is to subtract 3 from both sides to get y alone.	$(x+5)^2 - 3 = y + 3 - 3$
	$(x+5)^2 - 3 = y$
Now I must decide if the inverse is also a function. In this case it is but I need to restrict my domain.	$(x+5)^2 - 3 = f^{-1}(x)$
Domain of $f(x)$ is $[-3, \infty)$ so that becomes the range of $f^{-1}(x)$. The range of $f(x)$ is $[-5, \infty)$ so that is the domain of the inverse.	

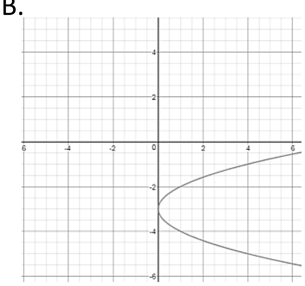
2. Which of the graphs below shows the inverse of the graph to the



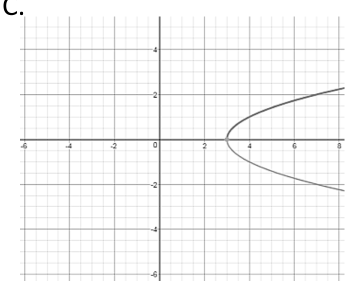
A.



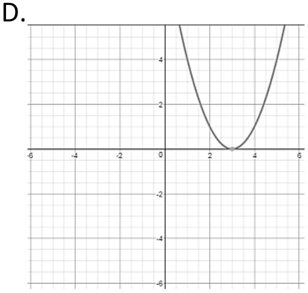
B.



C.



D.



The answer is B. The inverse of the given function will contain ordered pairs that have the x- coordinate and the y-coordinate reversed. I found the vertex of the original parabola at $(-3,0)$ so I knew the inverse would have its vertex at $(0,-3)$. I confirmed this decision by looking for the reflection over the y=x line.

Additional Practice on back →

1. Given $f(x) = (\frac{1}{3}x - 1)^3$, find $f^{-1}(x)$. Show all of your work next to each step. Box your final answer.

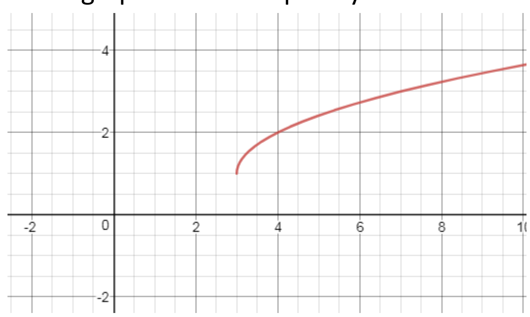
Step 1: Change from function notation to y=.

Step 2: Switch x and y in the equation.

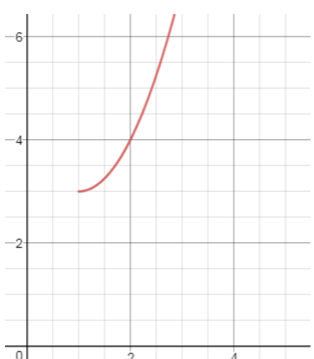
Step 3: Solve for y. (Use reverse PEMDAS)

Step 4: Determine if the inverse of $f(x)$ is a function. If so, write in function notation.

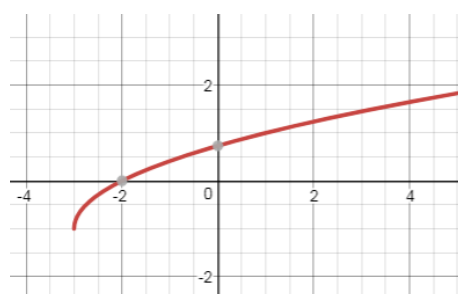
2. Which of the graphs shown is the inverse of the graph below? Explain your answer.



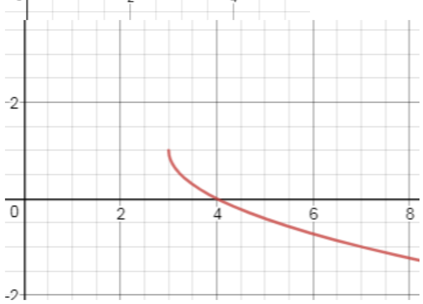
A



B



C



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