Bellwork Alg 2 Tuesday, October 1, 2019

State the domain restriction on such that the resulting inverse IS a function.

1. $y = -4x^2 + 2$

2. $y = 2(x-1)^2$

3. Given $f(x) = 3x - 7$ find $f^{-1}(5)$

4. Given $f(x) = \frac{x^2}{9} + 6 \,;\, x \geq 0$

a) Write the equation of the inverse. Simplify if possible.

b) Find $f^{-1}(10)$

5. Given the following function: $f(x) = 3x^2 + 4, x \geq -1$ is the inverse also a function?

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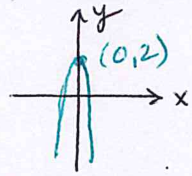
ANSWERS

State the domain restriction on such that the resulting inverse IS a function.

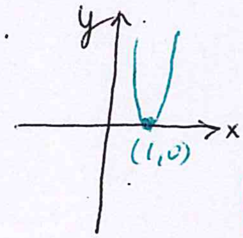
1. $y = -4x^2 + 2$

- opens down
- 4 times taller
- moved 2 units up



$\boxed{\text{Domain: } x \geq 0 \text{ or } [0, \infty)}$

2. $y = 2(x-1)^2$



- 2 times taller
- moved 1 unit right

$\boxed{\text{Domain: } x \geq 1 \text{ or } [1, \infty)}$

3. Given $f(x) = 3x - 7$ find $f^{-1}(5)$

one possible method:

1. write eq of inverse: $x = 3y - 7 \rightarrow f^{-1}(x) = \frac{x+7}{3}$
2. EVALUATE $f^{-1}(5) = \frac{5+7}{3} = \frac{12}{3} = \boxed{4}$

4. Given $f(x) = \frac{x^2}{9} + 6$; $x \geq 0$

a) Write the equation of the inverse. Simplify if possible.

$x = \frac{y^2}{9} + 6 - 6$
-6

$9(x-6) = \frac{y^2}{9} \cdot 9$

$\sqrt{9(x-6)} = \sqrt{y^2}$

$f^{-1}(x) = \sqrt{9(x-6)} = \sqrt{9}\sqrt{x-6}$

$= \boxed{3\sqrt{x-6}}$

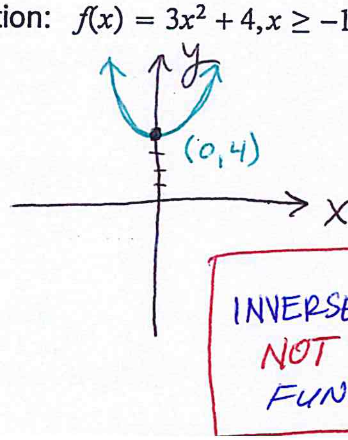
b) Find $f^{-1}(10)$

$f^{-1}(10) = 3\sqrt{10-6} = 3\sqrt{4} = 3 \cdot 2 = \boxed{6}$

5. Given the following function: $f(x) = 3x^2 + 4, x \geq -1$ is the inverse also a function?

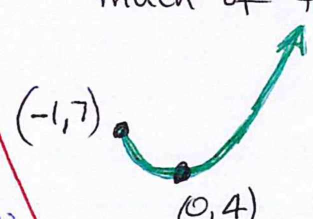
$f(x) = 3x^2 + 4$

- 3 times taller
- moved up 4



$\boxed{\text{INVERSE IS NOT A FUNCTION}}$

If Domain is $x \geq -1$ you will see this much of the parabola:



THIS part of the parabola doesn't pass the horiz. line test