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Date _____
Algebra II

Finding the Inverse of a Function

1. What is the inverse of the function $y = 2x - 3$?

(1) $y = \frac{x+3}{2}$

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

(2) $y = \frac{x}{2} + 3$

(4) $y = \frac{1}{2x-3}$

$$\begin{aligned} x &= 2y - 3 \\ +3 & \quad +3 \end{aligned}$$

$$\begin{aligned} \frac{x+3}{2} &= \frac{2y}{2} \\ \frac{x+3}{2} &= y \end{aligned}$$

2. If a function is defined by the equation $y = 3x + 2$, which equation defines the inverse of this function?

(1) $x = \frac{1}{3}y + \frac{1}{2}$

(3) $y = \frac{1}{3}x - \frac{2}{3}$

(2) $y = \frac{1}{3}x + \frac{1}{2}$

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

$$\begin{aligned} x &= 3y + 2 \\ -2 & \quad -2 \\ \frac{x-2}{3} &= \frac{3y}{3} \end{aligned}$$

$$y = \frac{1}{3}x - \frac{2}{3}$$

3. If $f(x) = x^2$, find $f^{-1}(x)$

$$\begin{aligned} \sqrt{x} &= y^2 \\ \sqrt{x} &= y \\ \sqrt{x} &= f^{-1}(x) \end{aligned}$$

4. If $f(x) = 5x - 7$, find $f^{-1}(x)$

$$\begin{aligned} x &= 5y - 7 \\ +7 & \quad +7 \\ \frac{x+7}{5} &= \frac{5y}{5} \\ \frac{x+7}{5} &= y \\ \frac{x+7}{5} &= f^{-1}(x) \end{aligned}$$

5. What is $g^{-1}(x)$ if $g(x) = 3x + 6$

$$\begin{aligned} x &= 3y + 6 \\ -6 & \quad -6 \\ x-6 &= 3y \\ \frac{x-6}{3} &= \frac{3y}{3} \\ \frac{x-6}{3} &= y \\ \frac{x-6}{3} &= g^{-1}(x) \end{aligned}$$

6. What is $h^{-1}(x)$ if $h(x) = x^2 + 2$

$h^{-1}(x) = \sqrt{x-2}$

$x = y^2 + 2$
 $\sqrt{x-2} = \sqrt{y^2+2-2}$
 $\sqrt{x-2} = \sqrt{y^2}$

7. What is the inverse of $y = \frac{1}{2}x + 2$?

$y = 2x - 4$

$2x = \frac{1}{2}y + 2$
 $2x = y + 4$
 $x = \frac{y+4}{2}$

8. For the function $f(x) = (x-3)^3 + 1$, find $f^{-1}(x)$.

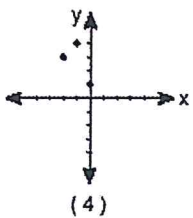
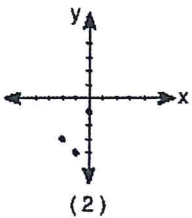
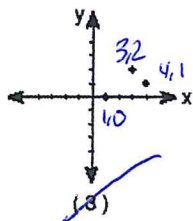
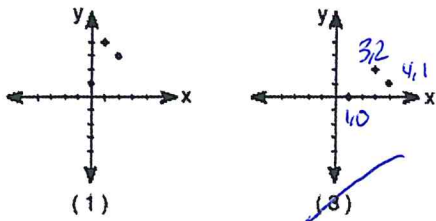
$x = (y-3)^3 + 1$
 $\sqrt[3]{x-1} = y-3$
 $\sqrt[3]{x-1} + 3 = y$
 $f^{-1}(x) = \sqrt[3]{x-1} + 3$

9. Given $f^{-1}(x) = -\frac{3}{4}x + 2$, which equation represents $f(x)$?

1) $f(x) = \frac{4}{3}x - \frac{8}{3}$
 2) $f(x) = -\frac{4}{3}x + \frac{8}{3}$
 3) $f(x) = \frac{3}{4}x - 2$
 4) $f(x) = -\frac{3}{4}x + 2$

$4(x) = (\frac{3}{4}y) + 2$
 $4x = -3y + 8$
 $\frac{4x-8}{3} = -y$
 $-\frac{4}{3}x + \frac{8}{3} = y$

10. Which graph represents the inverse of $f(x) = \{(0,1), (1,4), (2,3)\}$?



$(1,0), (4,1), (3,2)$