

Interpreting the Inverse

Name: _____

PD: _____ Date: _____

1. The cost of an ice cream sundae is given by the formula $C(s) = 1.25s + 3.25$. In this formula $C(s)$ represents the cost of the ice cream sundae and s is the number of scoops of ice cream. What do the rate of change and y-intercept represent? What does $C'(s)$ represent? What does the s in $C'(s)$ represent? Write the function $C^{-1}(s)$.

$\$1.25$ per scoop
 R.O.C =
 y-int: initial cost of ice cream w/o scoops
 $C^{-1}(s) = \#$ of scoops
 $C^{-1}(s)$'s "s" stands for cost
 $C^{-1}(s) = \frac{s - 3.25}{1.25}$
 $Y \rightarrow C(s) \rightarrow \text{cost}$ $X \rightarrow s \rightarrow \#$ of scoops

2. Cora's Carpet Repair uses the formula, $C(h) = 65h + 50$, to determine the amount to charge its customers, where c is the total charge for a job and h is the hours worked. What does the rate of change of the equation represent? What do the domain and range of $C^{-1}(h)$ represent? Write the function $C^{-1}(h)$.

R.O.C = $\$65$ per hour
 D of $C^{-1}(h) = \text{Total Charge}$
 R of $C^{-1}(h) = \text{hours}$
 $C^{-1}(h) = \frac{h - 50}{65}$

3. Harry's Hats hired a new hat maker. If $P(h) = 18 + 10h$ represents the profit, $P(h)$ from each hat sold, h , what do the rate of change and y-intercept mean? Write the function $P^{-1}(h)$ and determine what $P^{-1}(h)$ represents.

y-int: flat profit or initial profit
 r.o.c: profit per hat
 $P^{-1}(h) = \frac{h - 18}{10}$
 $P^{-1}(h) = \#$ of hats

4. The Bethel Blues Band charges a \$300 set up fee plus \$175 per hour that they play. Which statement represents the total cost for hiring the band?

- A. $C(h) = 175 + 300h$
- B. $C(h) = (175 + 300)h$
- C. $C(h) = 300 + 175h$
- D. $C(h) = 300 + 275 + h$

Then, determine what $C^{-1}(h)$ would represent.

$\#$ of hours

5. A local bookstore is encouraging its customers to drop off used books to be given to schools, libraries and other community organizations. They are offering to anyone who

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drops off books a special hard-cover edition of Oliver Twist for \$29.95 minus \$0.10 for each used book. The cost for the special edition of Oliver Twist can be expressed as $G(u) = 29.95 - 0.10u$. What do the rate of change, x-intercept, and y-intercept of the equation represent? What does $G^{-1}(u)$ represent? Write the function for $G^{-1}(u)$.

R.o.C: discount \$.10 per book

y-int: cost of Oliver Twist

x-int: # of books for cost to be 0

$G^{-1}(u)$ represents # of used books

$$G^{-1}(u) = \frac{u - 29.95}{-.10}$$

6. A country dinner restaurant charges \$6.00 for the main course and \$1.50 per side item. The cost of a chicken dinner special can be modeled by the linear relationship $C(s) = 1.50s + 6.00$. What does $C^{-1}(s)$ represent?

$$C^{-1}(s) = \# \text{ of sides}$$

7. Two months ago, Roy joined a wellness center that charges a flat fee of \$75 per month, which allows unlimited access to the gym and to the pool. Also available are special classes, such as yoga, that have an additional fee of \$15 per class. Last month Roy spent \$135. The relationship can be modeled by the function $f(x) = 75 + 15x$. What does $f^{-1}(x)$ represent?

$$f^{-1}(x) = \# \text{ of classes}$$

8. Video players rent for \$9.99 with an additional fee of \$1.59 per day. Suppose that Barbara wants to write a cost function to describe this relationship. Write a linear function to represent this. Then write the inverse function. Then determine what the domain and range for $f^{-1}(x)$ represents.

$$f^{-1}(x) = \# \text{ of days}$$

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Period: _____

Restricting domains for Inverses worksheet
Secondary III

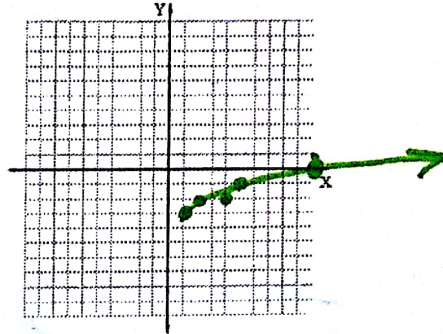
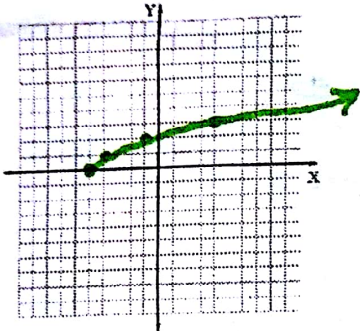
For each problem, identify the x-coordinate needed to make the function one-to-one. Write up the restricted domain. Graph the function based on the restricted domain. Find the Inverse for this function and the graph the inverse on the same graph. Give the domain for the inverse.

1. $y = x^2 - 5$

Domain: $x \geq 0$

2. $y = (x+3)^2 + 1$

Domain: $x \geq -3$



Inverse equation: $y^{-1} = \sqrt{x+5}$
Inverse domain: $x \geq -5$

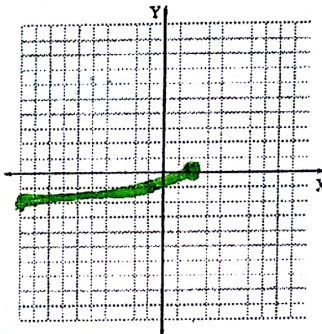
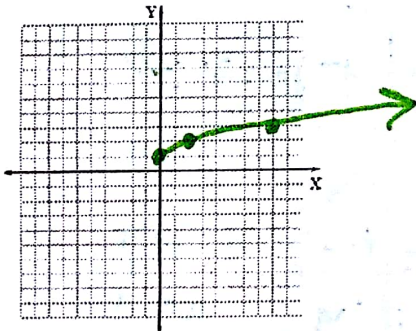
Inverse equation: $y^{-1} = \sqrt{x-1} - 3$
Inverse domain: $x > 1$

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

Domain: $x \geq 1$

4. $y = -3x^2 + 2$

Domain: $x \leq 0$



Inverse equation: $y^{-1} = \sqrt{\frac{x}{2}} + 1$
Inverse domain: $x \geq 0$

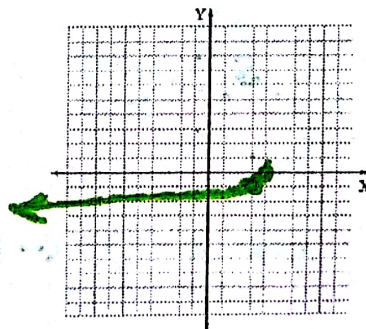
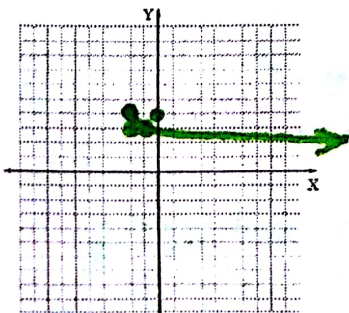
Inverse equation: $y^{-1} = \sqrt{\frac{x-2}{-3}}$
Inverse domain: $x \leq 2$

5. $y = (x-4)^4 - 2$

Domain: $x \leq 4$

6. $y = -x^4 + 4$

Domain: $x \leq 0$



Inverse equation: $y^{-1} = -\sqrt[4]{x+2} + 4$
Inverse domain: $x \geq -2$

Inverse equation: ~~$y^{-1} = \sqrt[4]{-x+4}$~~ $y^{-1} = -\sqrt[4]{-x+4}$
Inverse domain: $x \leq 4$