Honors Algebra II

Notes Section 3.4

Use Inverse Functions

VOCABULARY

Inverse Relation: _____

Inverse Functions: _____

EXAMPLE 1 Find an equation for the inverse of the relation.

a) $y = 3x-5$

b) $y = -2/3x + 2$

EXAMPLE 2 Verify $f(x)$ and $f^{-1}(x)$ are inverses.

$f(x) = 3x - 5$ and $f^{-1}(x) = 1/3x + 5/3$

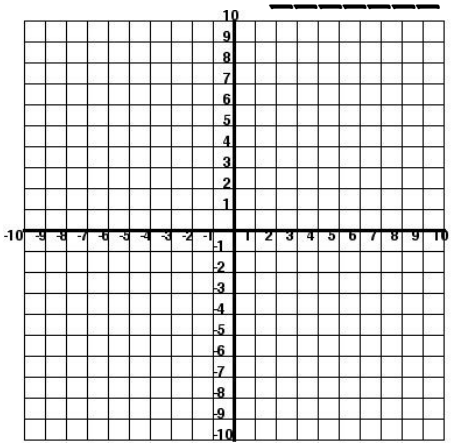
EXAMPLE 3 Elastic bands can be used in exercising to provide a range of resistance. A band's resistance R (in pounds) can be modeled by $R = 3/8L - 5$ where L is the total length of the stretched band (in inches).

a) Find the inverse. Hint: Do not switch the variable when working with a word problem to find the inverse. Please solve for the other variable.

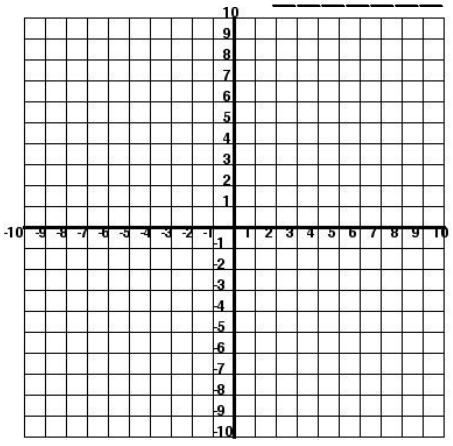
b) Find the length at which the band provides 19 pounds of resitance.

Inverses of Nonlinear Functions

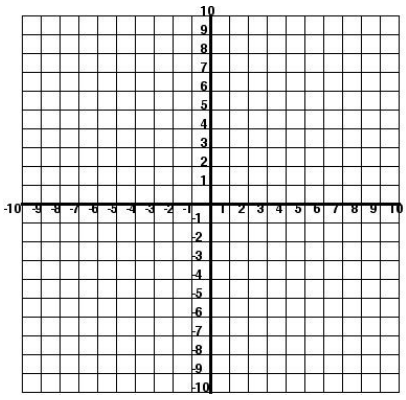
I. $f(x) = x^2$ Inverse: _____



II. $g(x) = x^3$ Inverse: _____



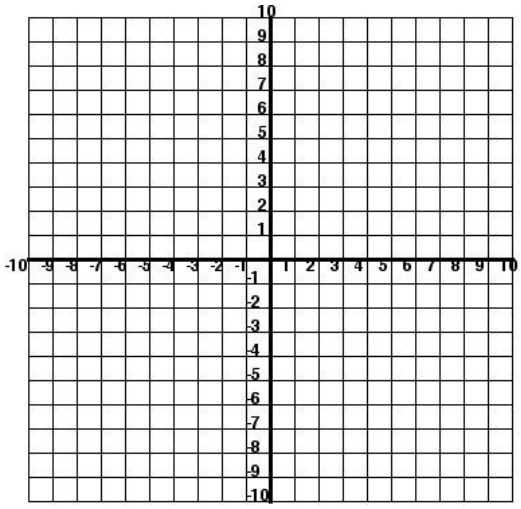
EXAMPLE 4 Find the inverse of $f(x) = x^2 + 2$, $x \leq 0$. Then Graph f and f^{-1}.



Vertical Line Test: to determine whether a graph represents a function.

Horizontal Line Test: to determine whether the inverse of a function is also a function.

EXAMPLE 5 Determine whether the inverse of $f(x) = 2x^3 + 1$ is a function. Then find the inverse.



EXAMPLE 6 The average price P (in dollars) for NFL tickets can be modeled by

$P = 35t^{0.192}$

where t is the number of years since 1995. Find the inverse model that gives time as a function of the average ticket price. Also, predict the year when the average ticket price will reach $58.