

Chapter 1.3: Inverse Functions

Calculus I

College of the Atlantic. Fall 2018

1. Consider $f(x)$ given below:

x	$f(x)$
-2	-6
-1	-4
0	-2
1	0
2	2
3	4

- (a) What is $f^{-1}(0)$?
- (b) What is $f^{-1}(-4)$?
- (c) Graph $f(x)$.
- (d) Graph $f^{-1}(x)$.
- (e) How are the graphs of $f(x)$ and $f^{-1}(x)$ related? Why?
2. Which of the following functions are invertible?
- (a) $f(x) = 3x + 2$
- (b) $g(x) = x^2$
- (c) The cost c of x pounds of rice purchased in bulk.
- (d) $h(t)$, the number of hamburgers eaten by Jamie McKown on day t , where t is measured in days since January 1, 2010.
3. The yumminess Q of TAB dinners increases quickly during the first three weeks of the term. It then decreases slowly for the rest of the term.
- (a) Sketch a possible graph for $Q(t)$, the quality of TAB dinners as a function of time, where time is measured in weeks since the start of a term.
- (b) Sketch a possible graph for $Q^{-1}(t)$.
4. Let $S(Q)$ give the fraction of TAB patrons consuming salads as a function of the quality of lunch entree. Assume that the lunch quality Q is measured on a scale of 1 to 5, with 5 indicating yumminess and 1 indicating in-edibility.
- (a) Sketch a possible graph for $S(Q)$.
- (b) What is the range of S ?
- (c) What is the domain of S ?
- (d) Sketch the inverse of $S(Q)$.
- (e) What is the meaning of $S(4.2) = 0.5$?
- (f) What is the meaning of $S^{-1}(0.78) = 3.9$?