Lesson 13

Read Chapter 9

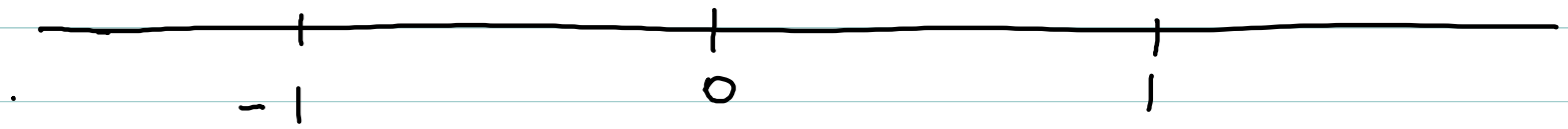
Inverse function

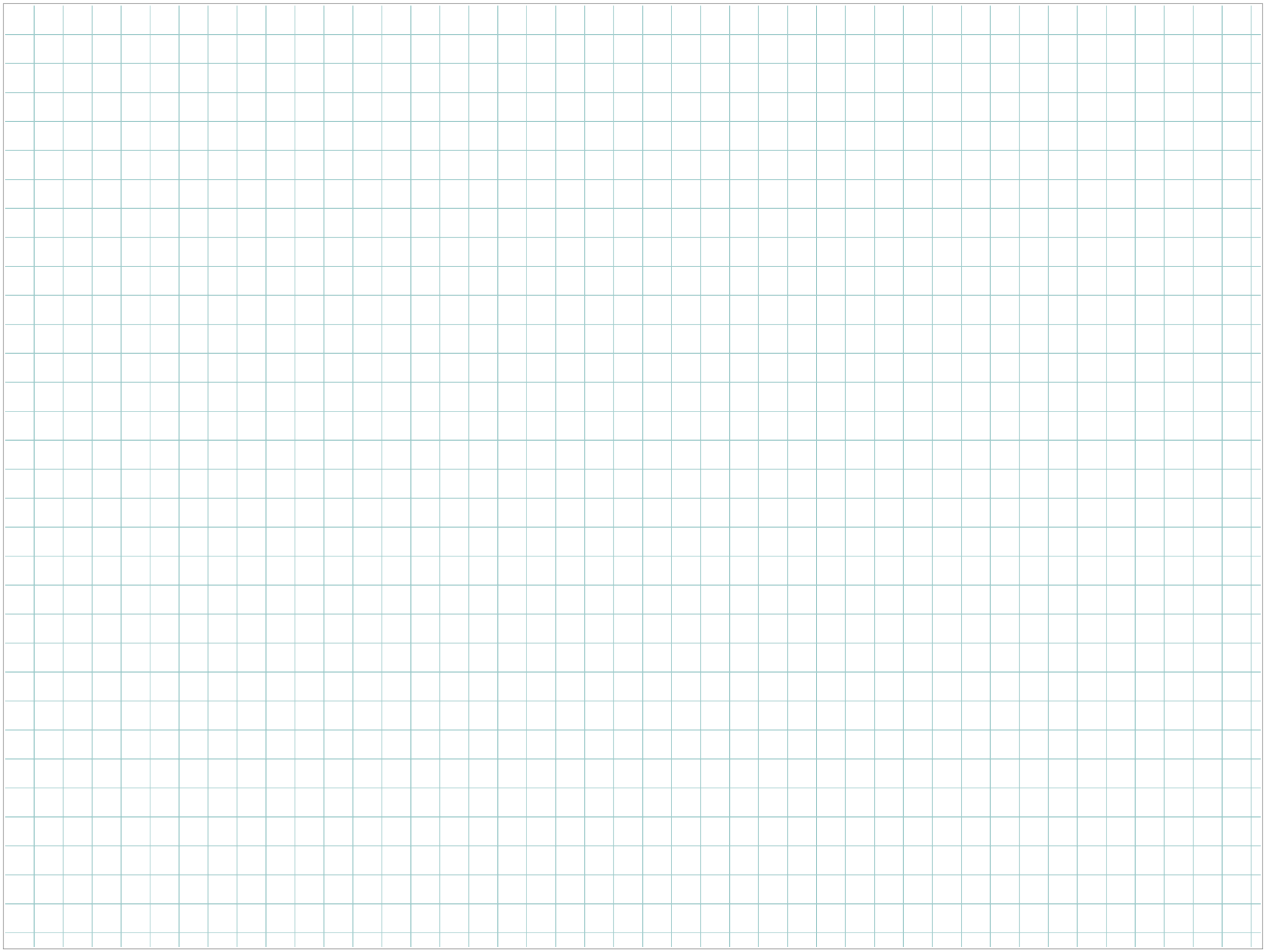
$$|1-|x|| = \begin{cases} |1-x| & \text{if } x \geq 0 \\ |1+x| & \text{if } x < 0 \end{cases}$$

$$|1-x| = \begin{cases} 1-x & \text{if } 1-x \geq 0 \text{ and } x \geq 0 \\ -(1-x) & \text{if } 1-x \leq 0 \text{ and } x \geq 0 \end{cases}$$

$$|1+x| = \begin{cases} 1+x & \text{if } 1+x \geq 0 \text{ and } x < 0 \\ -(1+x) & \text{if } 1+x < 0 \text{ and } x < 0 \end{cases}$$

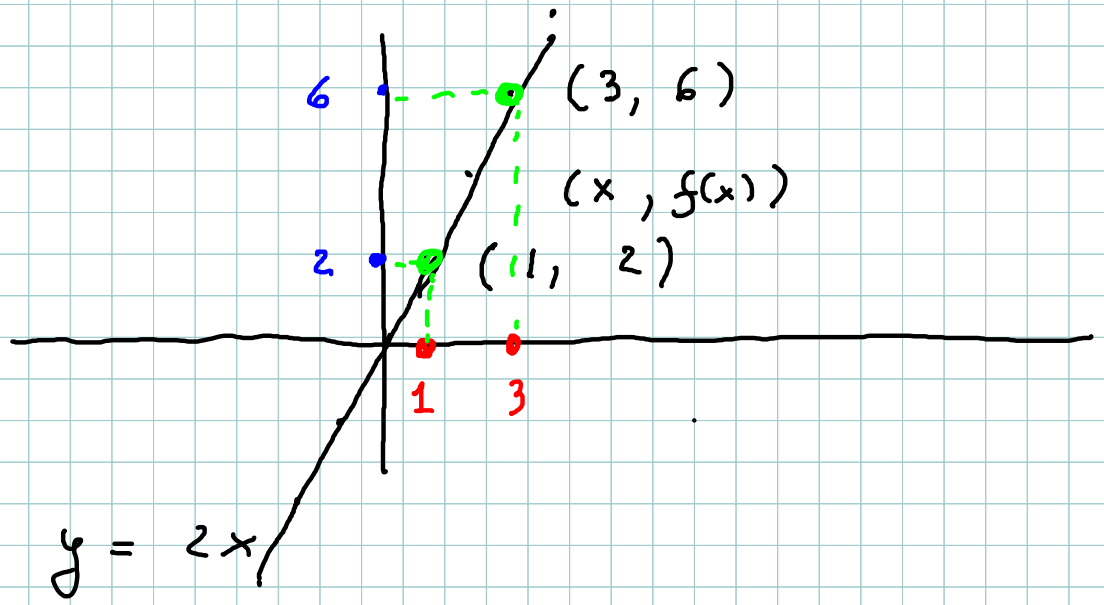
$$|1-|x|| = \begin{cases} 1-x & \text{if} \\ -1+x & \text{if} \\ 1+x & \text{if} \\ -1-x & \text{if} \end{cases}$$





Ch 9 Inverse functions

$f(x) = 2x$

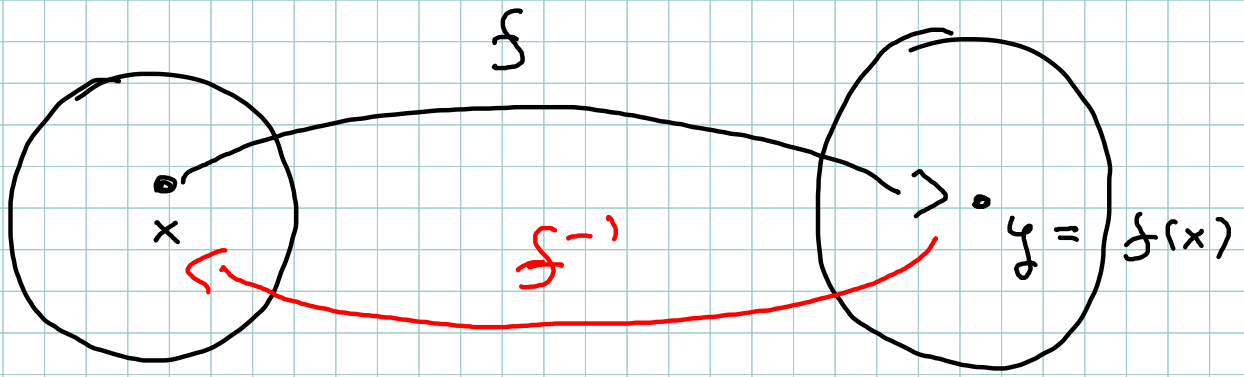


x	$f^{-1}(x)$
6	3
2	1
x	

Formula for $f(x)$ $f(x) = 2x$

Formula for $f^{-1}(y)$

Inverse function



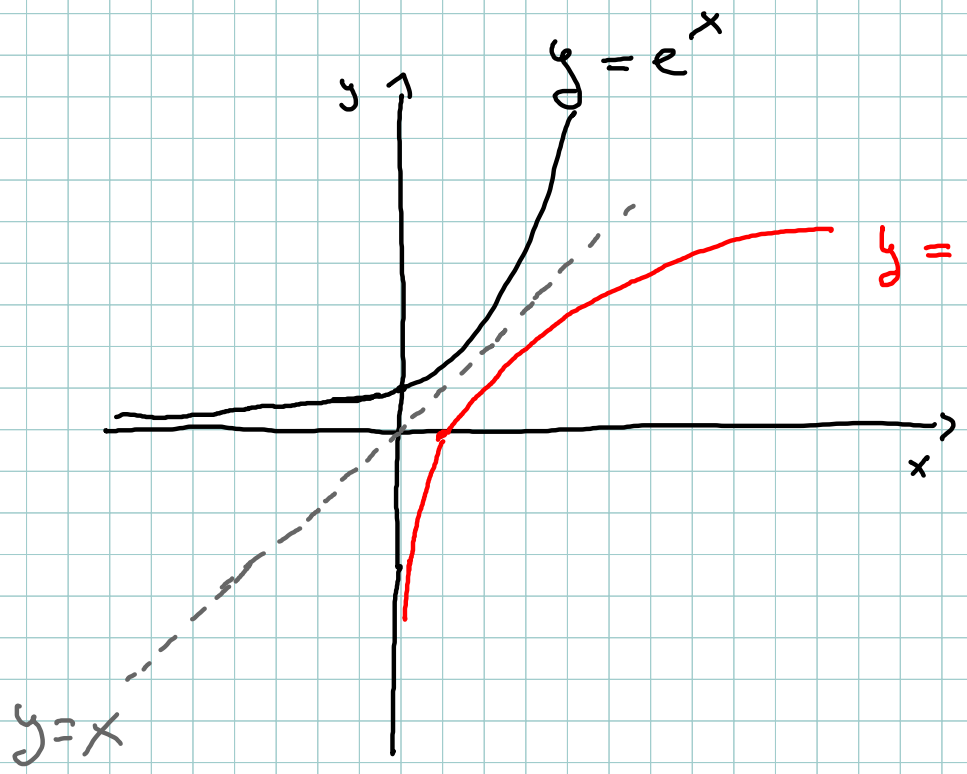
Domain of f

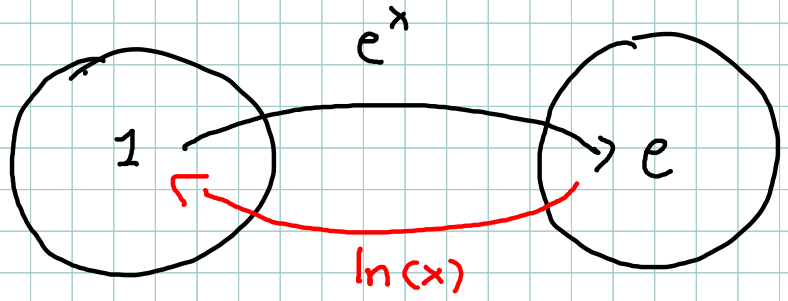
Range of f

Range of f^{-1}

Domain of f^{-1}

- The graph of $f^{-1}(y)$ is the graph of $f(x)$ flipped around the line $y = x$
- Domain f^{-1}= Range f. Range f^{-1} = Domain f
- To find a formula for f^{-1} set $y = f(x)$ and solve for x



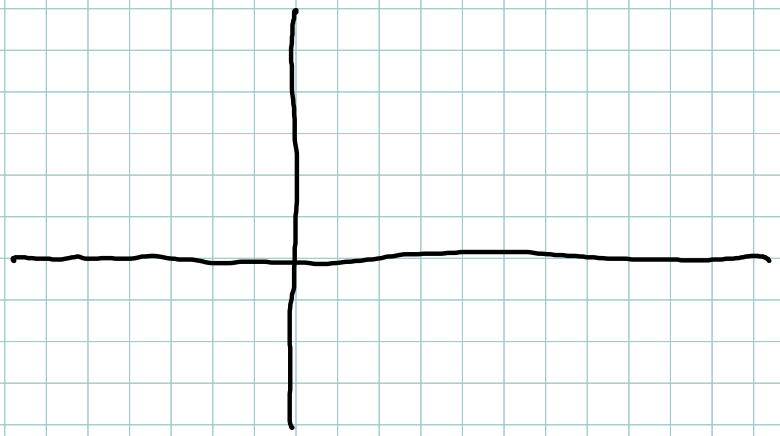


$$f^{-1}(f(x)) = x \qquad f(f^{-1}(y)) = y$$

Does $f(x) = x^2$ have an inverse function?

Domain:

Range:



Given $g(x) = 2x - 1$ on the domain $0 \leq x \leq 5$. Is g invertible ? If it is find the inverse , its domain and its range

Given $f(x) = \frac{2}{x-6}$. Is g invertible ? If it is find the inverse , its domain and its range

Explain why $f(x) = -2x^2 + 60x$ is not invertible.

What is the inverse of $f(x) = -2x^2 + 60x$ on $[15, +\infty)$

What is the inverse of $f(x) = -2x^2 + 60x$ on $(-\infty, 15]$

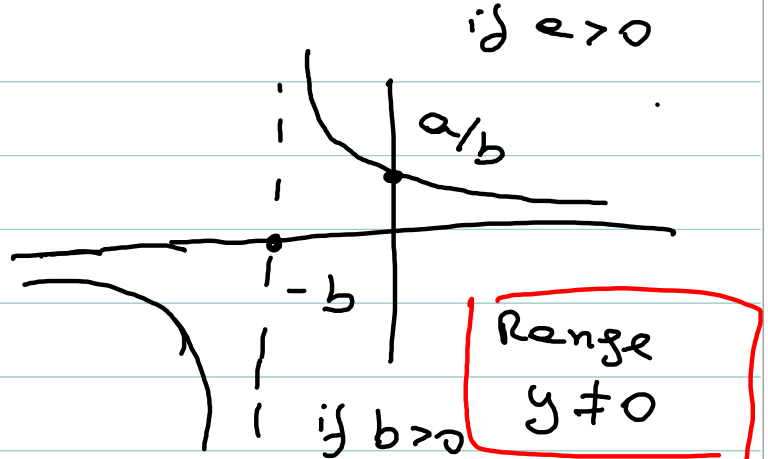
Suppose p is the price of an item and $q = f(p)$ is the number of items sold at that price. Explain in words the meaning of:

$f(25)$

$f^{-1}(30)$

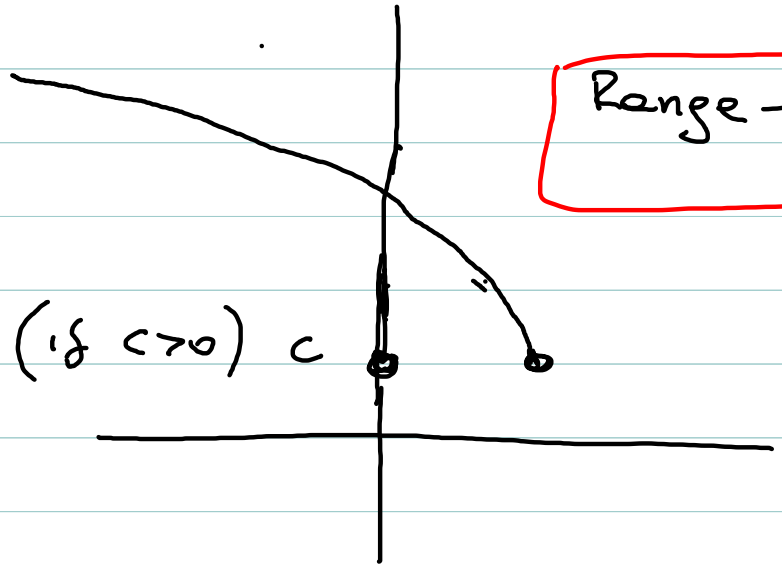
Graphs for Ch 9 problem 1

b) $h(x) = \dfrac{a}{x+b}$



Range $y \neq 0$

c) $g(x) = a\sqrt{b-x} + c$



Range - $y \geq c$