

# Section 3.3 / More Functions

Note Title

9/30/2009

I Clicker #1:  $T(x) = x + 34.5$

$$y = x + 34.5$$

$$x = y + 34.5$$

$$x - 34.5 = y$$

$$T^{-1}(x) = x - 34.5$$

(a)

Up until Now → a) Linear Functions  
→ b) Parabolas (quadratics)

- ① Power Functions
- ② Root Functions
- ③ Absolute Functions
- ④ Piecewise Functions

① Power Functions:

$$f(x) = a x^n$$

Some constant →  $a$

Some power →  $n$

$$f(x) = 2x^{1.3}$$
$$g(x) = 4x^2$$



Ex) Given  $f(x) = 2.698x^{1.3}$

Find  $f(2)$

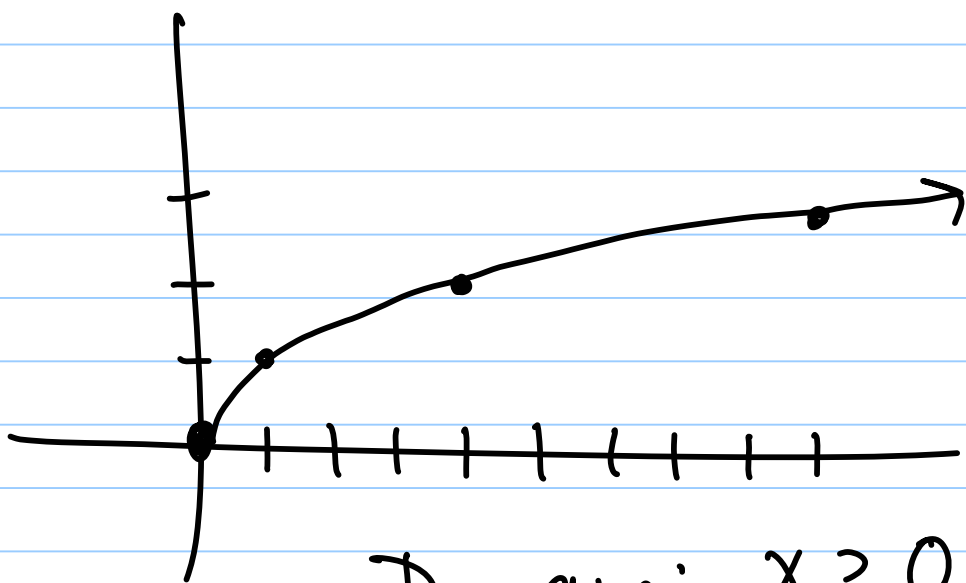
$$f(2) = 2.698 \left( 2^{1.3} \right)$$

$$\approx \boxed{6.643}$$

## ② Root Function (A type of power function)

a)  $f(x) = \sqrt{x} = x^{1/2}$

x	f(x)
0	0
1	1
4	2
9	3

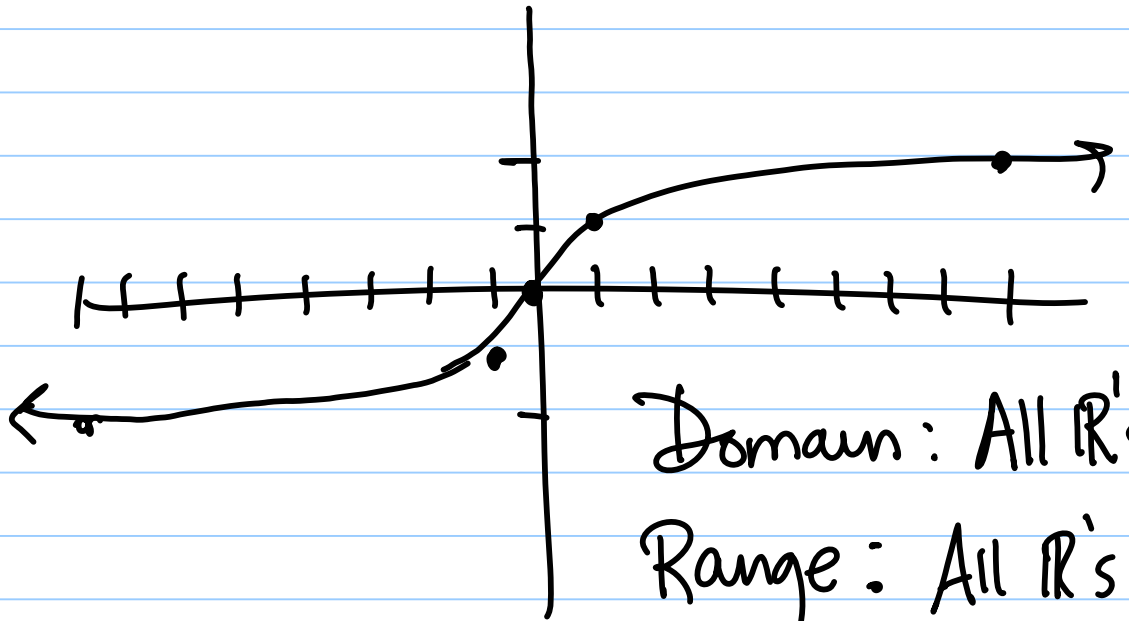


Domain:  $x \geq 0$

Range:  $y \geq 0$

$$\textcircled{b} \quad g(x) = \sqrt[3]{x} = x^{1/3}$$

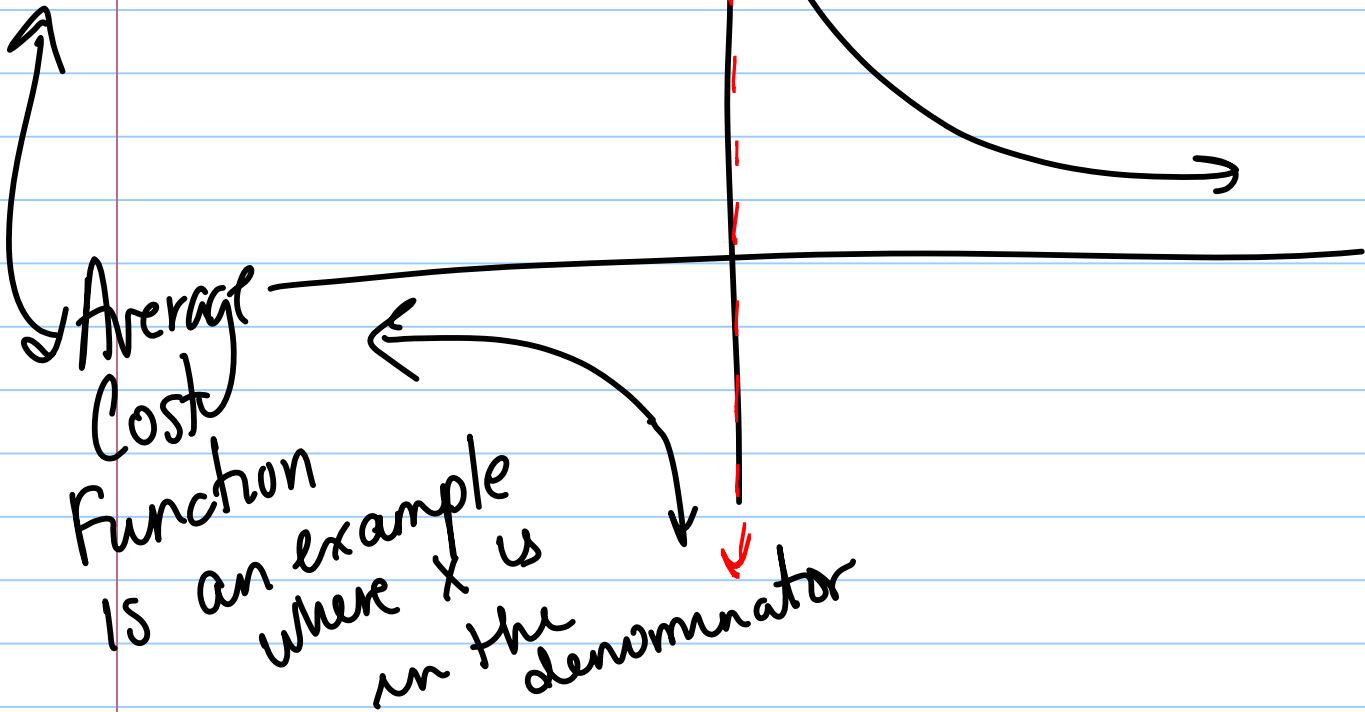
$x$	$g(x)$
8	2
1	1
0	0
-1	-1
-8	-2



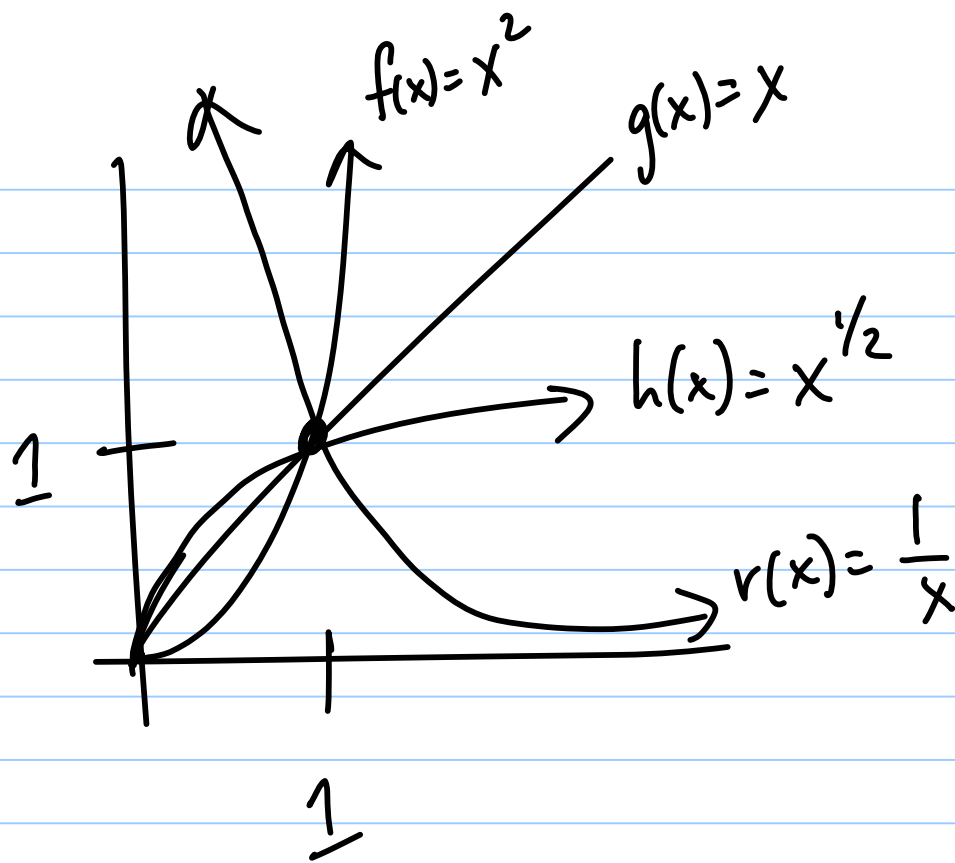
What happens when the power is negative?

$$f(x) = x^{-1} = \frac{1}{x}, \quad x \neq 0$$

"Rational Function"



For  $x \geq 0$ ,  
we have  
the following:



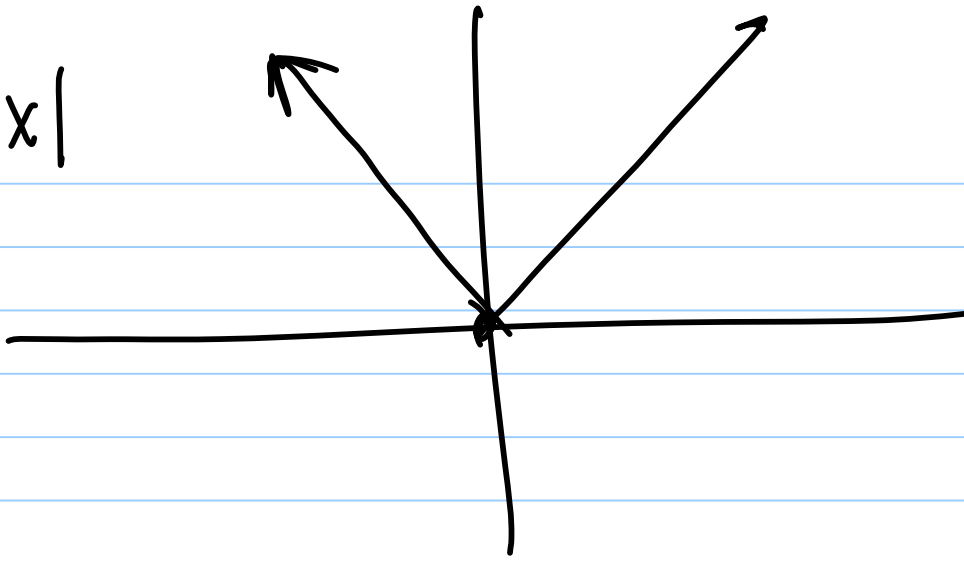
### ③ Absolute Value Function

$$f(x) = |x|$$

$$f(x) = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$$

"Piecewise  
Function"

$$f(x) = |x|$$

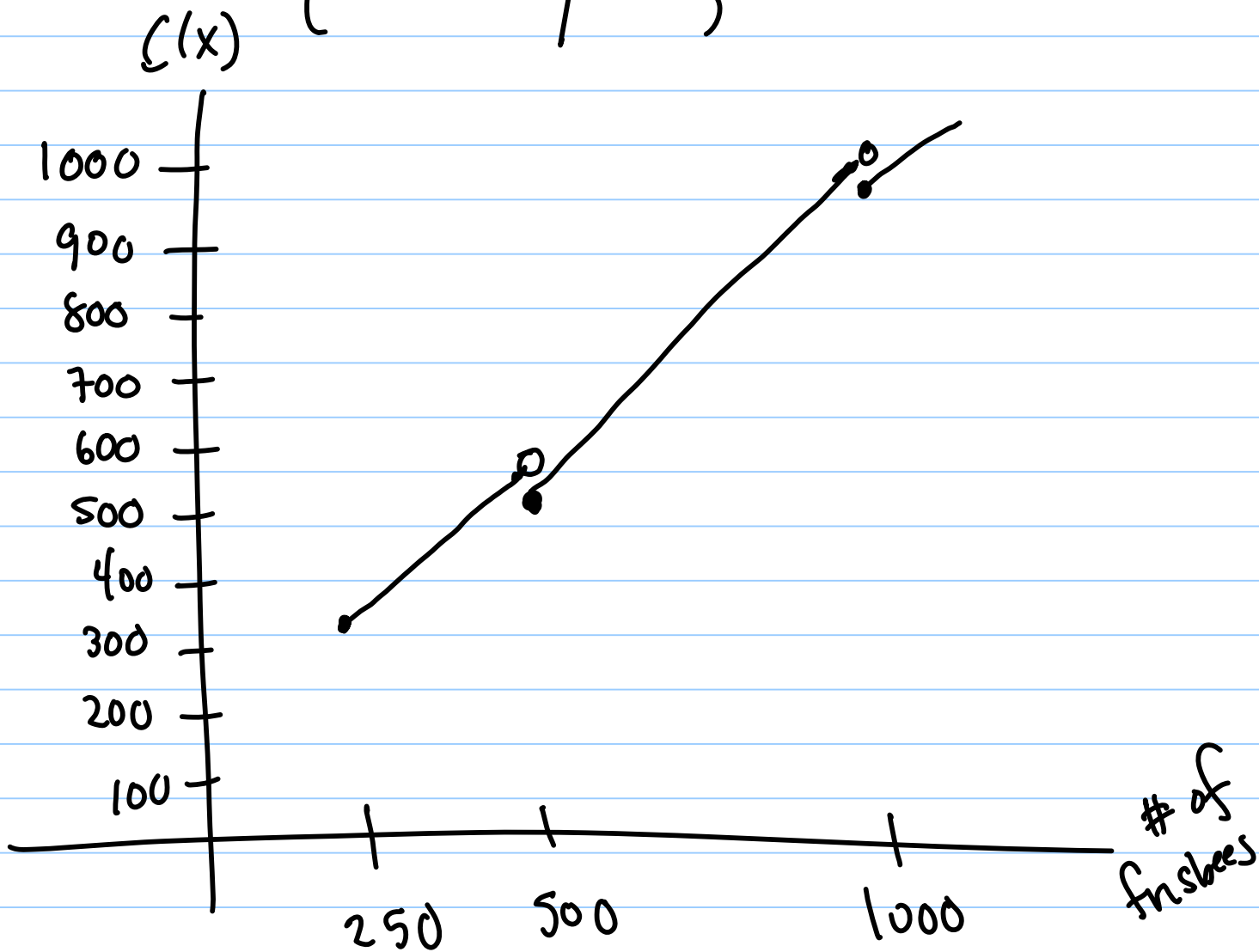


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Piecewise functions, next

Construct a piecewise function  $C(x)$ , that describes the cost of producing  $x$  fusbees

$$C(x) = \begin{cases} 50 + 1.09x, & 250 \leq x < 500 \\ 50 + .95x, & 500 \leq x < 1000 \\ 50 + .90x, & 1000 \leq x < 2500 \end{cases}$$



$$C(250) = \$323$$

$$C(500) = \$525$$

$$C(1000) = \$950$$

$$C(499) = \$593.91$$

$$C(999) = \$999.05$$