

Solutions to Assignment #1

2.1 # 4 (7 pts)

x	Slope
1.5	.575364
1.9	.512933
1.99	.501254
1.999	.500125
2.5	.446287
2.1	.487902
2.01	.498754
2.001	.499875

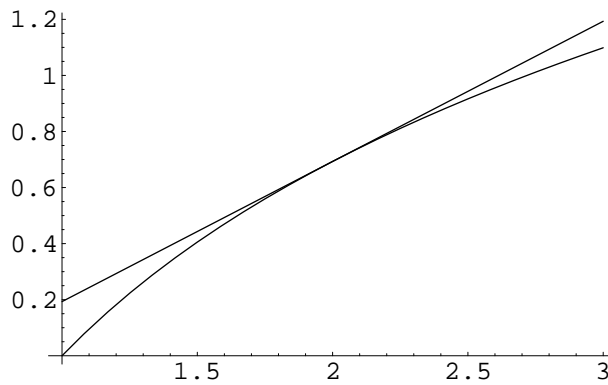
(a)

(b) Slope appears to be .5 or $\frac{1}{2}$.

(c) $y - \ln(2) = \frac{1}{2}(x - 2)$

or $y = \frac{1}{2}x - 1 + \ln(2)$

(d)



2.2 # 4 (5 pts)

(a)

$$\lim_{x \rightarrow 0} f(x) = 3$$

(b)

$$\lim_{x \rightarrow 3^-} f(x) = 4$$

(c)

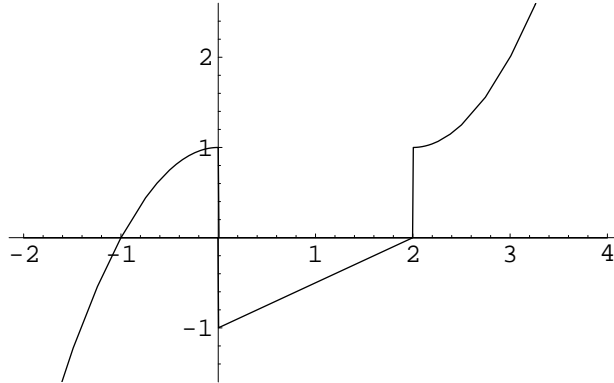
$$\lim_{x \rightarrow 3^+} f(x) = 2$$

(d)

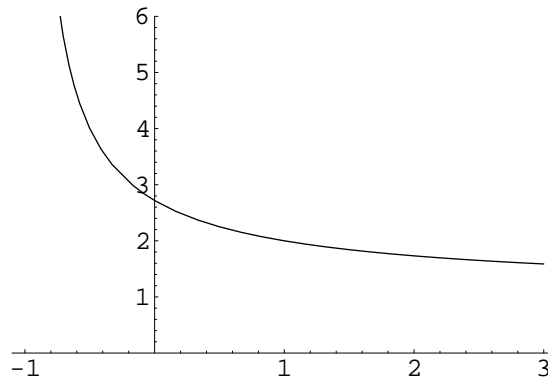
$\lim_{x \rightarrow 3} f(x)$ does not exist because $\lim_{x \rightarrow 3^-} f(x) \neq \lim_{x \rightarrow 3^+} f(x)$

(e)

$$f(3) = 3$$

2.2 #10 (4 pts)**2.3 #12 (3 pts)**

$$\lim_{x \rightarrow 1} \frac{x^3 - 1}{x^2 - 1} = \lim_{x \rightarrow 1} \frac{(x-1)(x^2 + x + 1)}{(x-1)(x+1)} = \lim_{x \rightarrow 1} \frac{x^2 + x + 1}{x+1} = \frac{3}{2}$$

Problem (6 pts)(a) Graph of $f(x) = (1+x)^{1/x}$ 

(b)	x	-.1	-.01	-.001	.1	.01	.001
	f(x)	2.868	2.732	2.720	2.594	2.705	2.717

$$\lim_{x \rightarrow 0} (1+x)^{1/x} \approx 2.718$$

(c)

$$\lim_{x \rightarrow 0} (1+x)^{1/x} = e$$