

MATH 100 – PRACTICE EXAM 1

Name: _____

Lecture: MWF 12 MWF 1 MWF 3

Recitation: T. Crawford Th 11 T. Crawford Th 1 T. Crawford Th 2
 G. Chiloyan Th 3 G. Chiloyan Th 11 G. Chiloyan Th 12

FOR FULL CREDIT, SHOW ALL WORK NO CALCULATORS
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1	
2	
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1. (a) Sketch the graph of a function with the following properties.

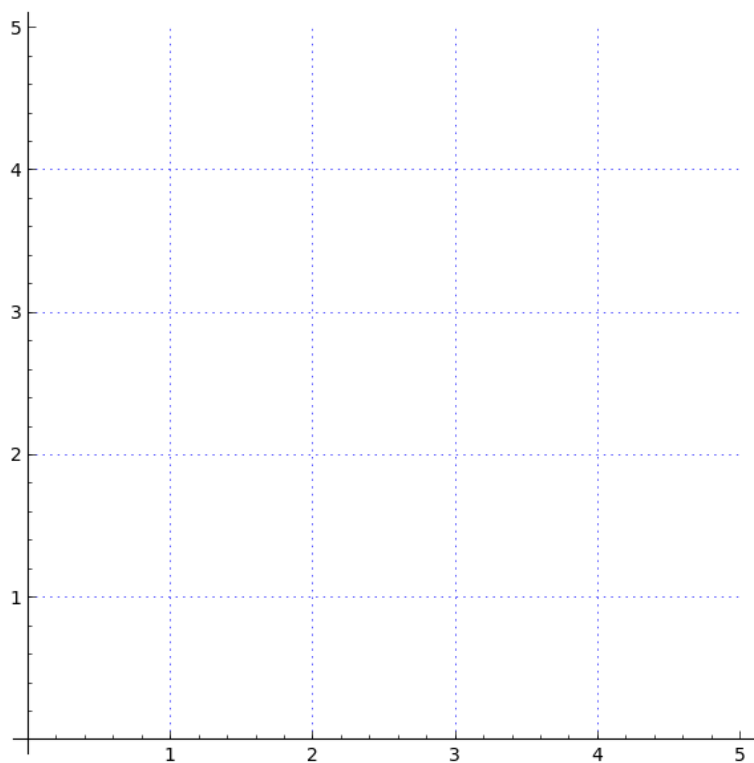
(8 points)

(i) $\lim_{x \rightarrow 1} f(x)$ does not exist

(ii) $f(1)$ is defined

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

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

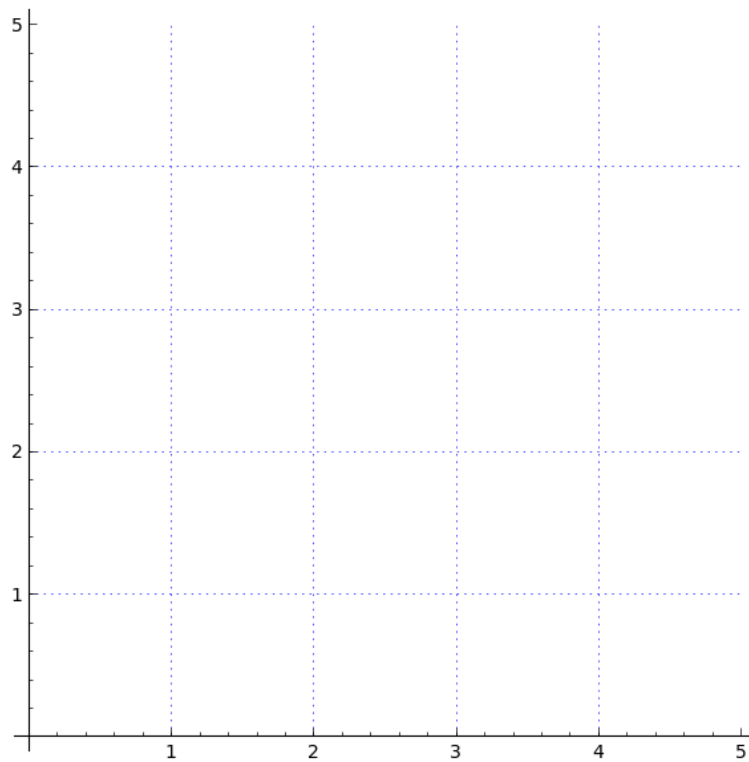
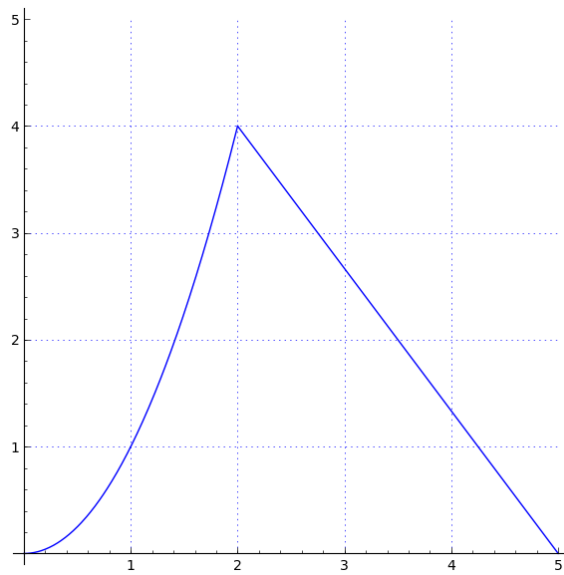


(b) What are the possible values of $f(3)$?

(2 points)

2. Sketch the graph of $f(2x) + 1$, given the following graph for $f(x)$.

(10 points)



3. Solve for x .

(10 points)

$$3^{2\log_3 x} - 2\ln e^x = 3$$

4. Using the basic limit laws, compute the following limit. *You must show at least five of the steps you are using to receive full credit.*

(10 points)

$$\lim_{t \rightarrow 2} (5t^2 + (t+1)\sqrt{t-1})$$

5. (a) Find the inverse function of

$$f(x) = \frac{1}{\sqrt{x+1}}.$$

(6 points)

- (b) Verify that you got the correct inverse function in part (a) by composing your answer $g(y)$ with $f(x)$. That is, compute $f \circ g$ and $g \circ f$. (4 points)

6. Find the average rate of change of the function $f(x) = x^3$ on the range $[1, 2]$. Is this average rate of change greater than or less than the instantaneous rate of change at $x = 1$? (10 points)