Matthew Boelkins **MTH201-10**
Assignment 09.08.15.Sec1.2 due 09/12/2015 at 10:00pm EDT

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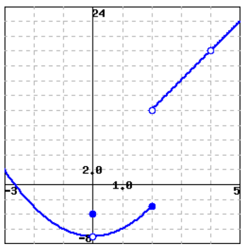
1. (2 pts) Use the figure below, which gives a graph of the function $f(x)$, to give values for the indicated limits.



(If any of the limits does not exist, enter the word **none** *in the answer blank for that limit.)*

(a) $\lim_{x\to -2} f(x) =$ ________
(b) $\lim_{x\to 0} f(x) =$ ________
(c) $\lim_{x\to 2} f(x) =$ ________
(d) $\lim_{x\to 4} f(x) =$ ________

Answer(s) submitted:

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(incorrect)

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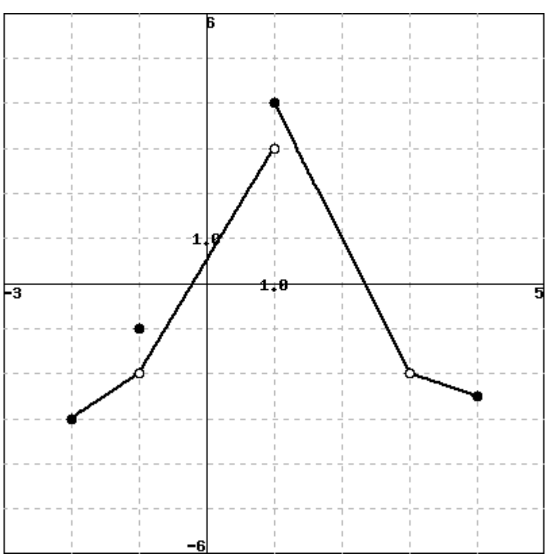
2. (3 pts) Let F be the function in the graph shown below.



Note: You can click on the graph to make it larger.

Evaluate each of the following expressions. Enter *DNE* if the limit does not exist.

a) $\lim_{x\to -1^-} F(x) =$ ___

b) $\lim_{x\to -1^+} F(x) =$ ___

c) $\lim_{x\to -1} F(x) =$ ___

d) $F(-1) =$ ___

e) $\lim_{x\to 1^-} F(x) =$ ___

f) $\lim_{x\to 1^+} F(x) =$ ___

g) $\lim_{x\to 1} F(x) =$ ___

h) $\lim_{x\to 3} F(x) =$ ___

i) $F(3) =$ ___

Answer(s) submitted:

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(incorrect)

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3. (1 pt) Use a graph to estimate the limit

$$\lim_{\theta\to 0} \frac{\sin(2\theta)}{\theta}.$$

Note: θ is measured in radians. All angles will be in radians in this class unless otherwise specified.

$\lim_{\theta\to 0} \frac{\sin(2\theta)}{\theta} =$ ________________

Answer(s) submitted:

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(incorrect)

4. (3 pts) Consider the function $f(x) = \frac{\sin(4x)}{x}$.
(a) Fill in the following table of values for $f(x)$:

$x =$	-0.1	-0.01	-0.001	-0.0001	0.0001	0.001	0.01	0.1
$f(x) =$	___	___	___	___	___	___	___	___

(b) Based on your table of values, what would you expect the limit of $f(x)$ as x approaches zero to be?
$\lim_{x\to 0} \frac{\sin(4x)}{x} =$ ___

(c) Graph the function to see if it is consistent with your answers to parts (a) and (b). By graphing, find an interval for x near zero such that the difference between your conjectured limit and the value of the function is less than 0.01. In other words, find a window of height 0.02 such that the graph exits the sides of the window and not the top or bottom. What is the window?
___ $\leq x \leq$ ___,
___ $\leq y \leq$ ___.

Answer(s) submitted:

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(incorrect)

5. (3 pts) Consider the function $f(x) = \frac{4^x - 1}{x}$.
(a) Fill in the following table of values for $f(x)$:

$x =$	-0.1	-0.01	-0.001	-0.0001	0.0001	0.001	0.01	0.1
$f(x) =$	___	___	___	___	___	___	___	___

(b) Based on your table of values, what would you expect the limit of $f(x)$ as x approaches zero to be?
$\lim_{x\to 0} \frac{4^x - 1}{x} =$ ___

(c) Graph the function to see if it is consistent with your answers to parts (a) and (b). By graphing, find an interval for x near zero such that the difference between your conjectured limit and the value of the function is less than 0.01. In other words, find a window of height 0.02 such that the graph exits the sides of the window and not the top or bottom. What is the window?
___ $\leq x \leq$ ___,
___ $\leq y \leq$ ___.

Answer(s) submitted:

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(incorrect)

6. (1 pt) For the function

$$f(x) = \begin{cases} x^2 - 5, & 0 \leq x < 1 \\ 2, & x = 1 \\ 2x - 6, & \\ 1 < x & \end{cases}$$

use algebra to find each of the following limits:
$\lim_{x\to 1^+} f(x) =$ ______
$\lim_{x\to 1^-} f(x) =$ ______
$\lim_{x\to 1} f(x) =$ ______
(For each, enter **dne** *if the limit does not exist.)*

Sketch a graph of $f(x)$ to confirm your answers.

Answer(s) submitted:

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(incorrect)

7. (1 pt) Evaluate the limit

$$\lim_{x\to -7} \frac{x^2 - 49}{x + 7}$$

If the limit does not exist enter DNE.

Limit = ______

Answer(s) submitted:

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(incorrect)

8. (1 pt) Evaluate the limit

$$\lim_{x\to 1} \frac{x - 7}{x^2 - 7x}$$

If the limit does not exist enter DNE.

Limit = __________

Answer(s) submitted:

-

(incorrect)