

# TMATH 124: Quiz 1

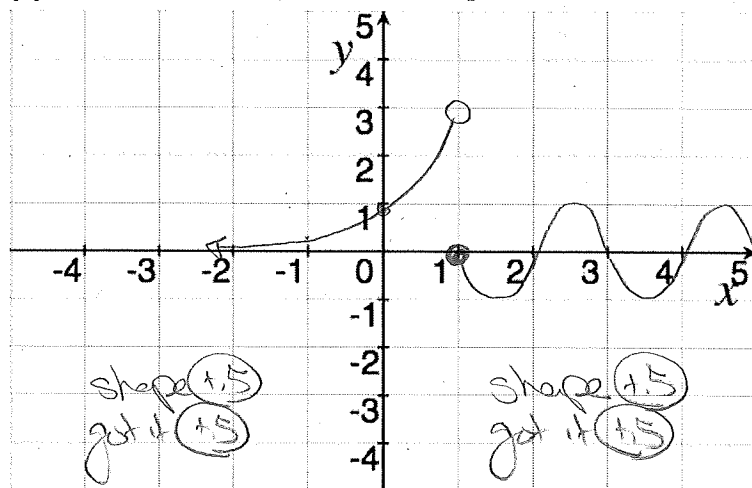
Key

Show *all* your work (numerically, algebraically, or geometrically) for each and simplify. No credit is given without supporting work.

1. (§2.2 #12) Let  $f(x) = \begin{cases} 3^x & \text{if } x < 1 \\ \sin(\pi x) & \text{if } 1 \leq x \end{cases}$

$\sin(x)$  curve w/ period of  $2\pi = 2$

(a) [2] Carefully graph  $f$  on the axis provided



(b) [1] Determine the values of  $c$  for which  $\lim_{x \rightarrow c} f(x)$  exists.

give exact wrong answer (1.5)

all  $x$  except  $x=1$   
(1)

2. [2] (WebHW3 #8) Find:

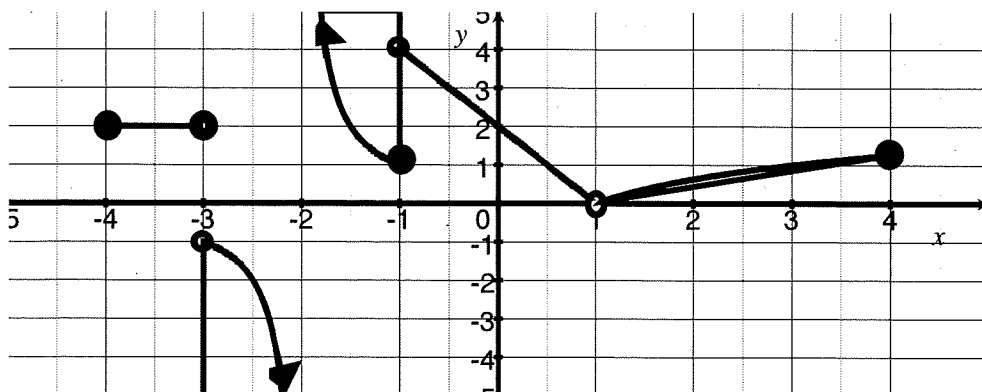
notch (1.5)

$$\lim_{t \rightarrow 0} \left( \frac{9}{t} - \frac{9}{t^2 + t} \right)$$

$$\begin{aligned} &= \lim_{t \rightarrow 0} \left( \frac{9}{t} - \frac{9}{t(t+1)} \right) \\ &= \lim_{t \rightarrow 0} \frac{9(t+1) - 9}{t(t+1)} \quad \left( \begin{array}{c} \text{factored } t+1 \\ \text{calc 1.5 or} \end{array} \right) \\ &= \lim_{t \rightarrow 0} \frac{9t + 9 - 9}{t(t+1)} \\ &= \lim_{t \rightarrow 0} \frac{9t}{t(t+1)} = \lim_{t \rightarrow 0} \frac{9}{t+1} \\ &= \frac{9}{0+1} = 9 \end{aligned}$$

table  
(1.5)  
got it (1.5)

3. [2] (limit laws wks #2) For the function  $f$  whose graph is given, estimate the value of each quantity, if it exists.



$$f(-1)$$

$$\lim_{x \rightarrow 1} f(x)$$

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

1  
1.5

0  
1.5

-1  
11

Not accepted

4. [3] (Limit Wks #3) Sketch a graph of a function  $\alpha$  that satisfies *all* of the following:

(a)  $\lim_{x \rightarrow -1} \alpha(x) = 3$  (+1)

(b)  $\lim_{x \rightarrow 2^+} \alpha(x) = \infty$  (+1)

And there are lots of correct answers?

