

Quiz 1 (pm) Key

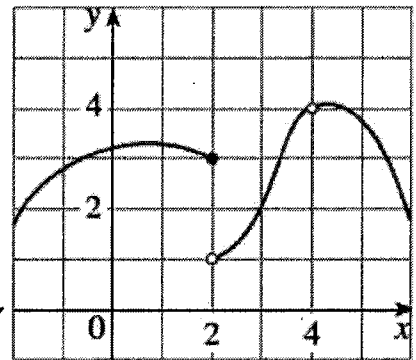
This is a two-stage quiz. During the first stage, use your knowledge & calculator to take this quiz. You have 15 min. In the second stage, you are now welcome to use your books, notes, and students in the class to retake the same quiz. You have 15 min. to write one solution (with everyone's name on it!!!) to be turned in for the group.

Show *all* your work. Reasonable supporting work must be shown for any partial credit.

1. [3] (§2.3 #2 & WebHW1#1) Use the graph of f below to find the limits (either numerically, graphically, or algebraically), if they exist:

$$\lim_{x \rightarrow 4} [f(x) + f(x)] = \lim_{x \rightarrow 4} f(x) + \lim_{x \rightarrow 4} f(x) \quad (+1.5)$$

$$4 + 4 = 8 \quad (+1.5)$$



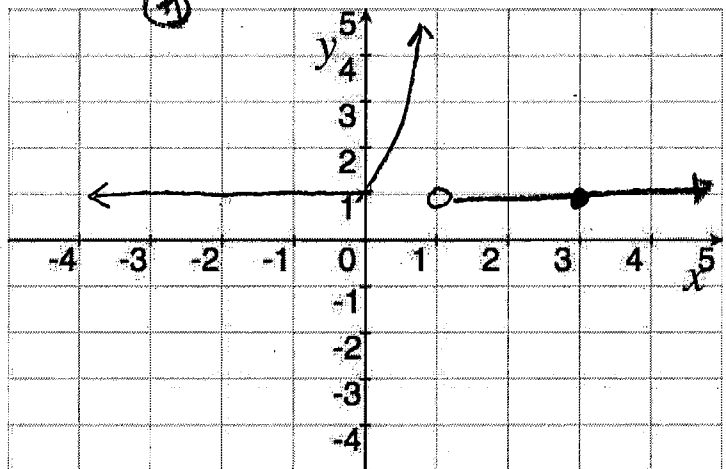
$$\lim_{x \rightarrow 2} f(x) \quad \text{DNE} \quad (+1)$$

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

2. [4] (LimitActivity#3) Sketch the graph of a function α that satisfies *all* of the following.

- (a) $\lim_{x \rightarrow -2} \alpha(x) = 1$ (+1) ✓
 (b) $\lim_{x \rightarrow 1^-} \alpha(x) = \infty$ (+1) ✓
 (c) $\alpha(3) = 1$ (+1) ✓

Note there are lots
of corrections users
for this?



3. (WebHW2#6) Let $f(x) = 2x^2$. Find $\lim_{h \rightarrow 0} \frac{f(1+h) - f(1)}{h}$

$$\lim_{h \rightarrow 0} \frac{f(1+h) - f(1)}{h} = \lim_{h \rightarrow 0} \frac{2(1+h)^2 - 2}{h}$$

$$= \lim_{h \rightarrow 0} \frac{2(1+2h+h^2) - 2}{h} = \lim_{h \rightarrow 0} \frac{4h + 2h^2}{h} = \lim_{h \rightarrow 0} \frac{4+2h}{1} = 4 + 2 \cdot 0 = 4$$

note: this could be done graphically

$$f(1+h) = 2(1+h)^2 = 2(1+h)(1+h) = 2(1+h+h+h^2) = 2+4h+2h^2$$

$$f(1) = 2(1)^2 = 2$$

notation (+1.5)
alg (+1)