

Math 1a – Quiz 3

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1. (2 points each). Compute the following six limits.

(a) $\lim_{h \rightarrow 0} \frac{(2+h)^3 - 8}{h}$

(b) $\lim_{y \rightarrow 7} \frac{\sqrt{y+2} - 3}{y - 7}$

(c) $\lim_{\theta \rightarrow \frac{\pi}{2}^+} \sec \theta$

(d) $\lim_{t \rightarrow \infty} \frac{e^{t^2-3t+1}}{e^{t^3-t+2}}$

(e) $\lim_{x \rightarrow 2^+} \left(\frac{3}{|x-2|} + \frac{3}{x-2} \right)$

$$(f) \lim_{x \rightarrow 2^-} \left(\frac{3}{|x-2|} + \frac{3}{x-2} \right)$$

2. (3 points). Sketch the graph of an example of a function f that satisfies all of the given conditions.

$$(a) \lim_{x \rightarrow 0^-} f(x) = 1$$

$$(b) \lim_{x \rightarrow 0^+} f(x) = \infty$$

$$(c) \lim_{x \rightarrow -\infty} f(x) = -1$$

$$(d) \lim_{x \rightarrow \infty} f(x) = -\infty$$

$$(e) \lim_{x \rightarrow -1} f(x) = 0$$

$$(f) f \text{ is defined at } -1, \text{ and } f(-1) \neq 0.$$