

Quiz 3 Key — MA16010 — September 11, 2017

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Min	Mean	Max
1	3.4	5

1. (1 point) What is the definition of $f'(x)$, the derivative of $f(x)$?

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

2. (2 points) What is $\frac{dy}{dx}$ when $y = 3e^x - \cos(x) + \sqrt{x}$?

$$\frac{dy}{dx} = 3e^x + \sin(x) + \frac{1}{2\sqrt{x}}$$

3. (2 points) Find $f'(x)$ using the limit definition when

$$f(x) = \frac{2}{3-4x}.$$

$$\begin{aligned} f(x+h) &= \frac{2}{3-4x-4h} \\ f(x+h) - f(x) &= \frac{2}{3-4x-4h} - \frac{2}{3-4x} \\ &= \frac{2(3-4x) - 2(3-4x-4h)}{(3-4x-4h)(3-4x)} \\ &= \frac{8h}{(3-4x-4h)(3-4x)} \\ \frac{f(x+h) - f(x)}{h} &= \frac{8}{(3-4x-4h)(3-4x)} \\ f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} &= \frac{8}{(3-4x)^2} \end{aligned}$$