

Quiz # 4

Select an answer for problem # 1, no justification required.

1. Find a function f and a number a so that the following limit represents a derivative $f'(a)$:

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

- (a) $f(x) = x^3$ and $a = 2$
(b) $f(x) = x^3$ and $a = 2^3$
(c) $f(x) = (x+h)^3$ and $a = 2$
(d) $f(x) = (2+x)^3$ and $a = 2$
(e) None of the above

Your answer to problem # 2 should be written in complete sentences in a clear and concise manner. An answer without explanation or that is poorly presented may not receive full credit.

2. Let $f(x) = \frac{7}{3}x^2 + 2.2x + 4$. Use the power rule and sum rule for derivatives to find $f'(x)$.

By the power and sum rules,

$$\begin{aligned} \frac{d}{dx}(f(x)) &= \frac{d}{dx} \left(\frac{7}{3}x^2 + 2.2x + 4 \right) \\ &= \frac{7}{3} \frac{d}{dx}(x^2) + 2.2 \frac{d}{dx}(x) + \frac{d}{dx}(4) \\ &= \frac{7}{3} \cdot 2x + 2.2 \cdot 1 + 0 \\ &= \boxed{\frac{14}{3}x + 2.2} \end{aligned}$$