



Quiz 2.3 – Definition and Properties of the Derivative

1. (1 pt) [alfredLibrary/AUCI/chapter2/lesson3/quiz-differencequotient1pet.pg](#)

Compute the derivative of $f(x) = 7x^2$ at $x_0 = 6$ using the limit definition of the derivative at a point.

(HINTS: To enter Δx , type `deltax` (with no spaces). Write out your work on paper first, then enter your answers. Follow the step-by-step instructions. Copy and paste as much as you can to avoid typing errors. Check your answers frequently.)

$$f'(6) = \lim_{\Delta x \rightarrow 0} \frac{f(6 + \Delta x) - f(6)}{\Delta x}$$

Substitute $6 + \Delta x$ and 6 into f :

$$= \lim_{\Delta x \rightarrow 0} \frac{\quad - \quad}{\quad}$$

FOIL and eliminate parentheses in the first term of the numerator:

$$= \lim_{\Delta x \rightarrow 0} \frac{\quad - \quad}{\quad}$$

Cancel like terms in the numerator:

$$= \lim_{\Delta x \rightarrow 0} \frac{\quad}{\quad}$$

Cancel like factors in the numerator and denominator:

$$= \lim_{\Delta x \rightarrow 0} \frac{\quad}{\quad}$$

Set Δx equal to 0:

$$= \quad$$

Now check your answer by using the derivative formula for a quadratic...

2. (1 pt) [alfredLibrary/AUCI/chapter2/lesson3/quiz-differencequotient2pet.pg](#)

Compute the derivative of $f(x) = 3x^2$ using the limit definition of the derivative function.

(HINTS: To enter Δx , type `deltax` (with no spaces). Write out your work on paper first, then enter your answers. Follow the step-by-step instructions. Copy and paste as much as you can to avoid typing errors. Check your answers frequently.)

$$f'(x)$$

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

Substitute $x + \Delta x$ into f :

$$= \lim_{\Delta x \rightarrow 0} \frac{\quad - \quad}{\quad}$$

FOIL and eliminate parentheses in the first term of the numerator:

$$= \lim_{\Delta x \rightarrow 0} \frac{\quad - \quad}{\quad}$$

Cancel like terms in the numerator

$$= \lim_{\Delta x \rightarrow 0} \frac{\quad}{\quad}$$

Cancel like factors in the numerator and denominator:

$$= \lim_{\Delta x \rightarrow 0} \frac{\quad}{\quad}$$

Set Δx equal to 0:

$$= \quad$$

Now check your answer by using the derivative formula for a quadratic...