RATE: Rate of Change – 100%

The question may ask you to:
- determine the rate of change of a function over an interval,
- compare the rate of change of a function over different intervals,
- compare the rate of change of different functions over the same interval, or
- interpret the rate of change in the given context.

If the function is given as a graph or table, use the slope formula. If the function is given as an equation, define the function.

The function $f(x) = 2^{-0.25x} \cdot \sin\left(\frac{\pi}{2}x\right)$ represents a damped sound wave function. What is the average rate of change for this function on the interval $[-7,7]$, to the *nearest hundredth*?

(1) −3.66

(3) −0.26

(2) −0.30

(4) 3.36

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Add a Calculator page.	
Enter menu, 1, 1 and define the function.	
Use the slope formula to find the rate of change over the given interval.	
(3) is the correct response.	
If this were an open ended question, you must show the calculator input, such as by writing the information on the screen.	

Defining the function is particularly helpful when comparing the rate of change of a function over different intervals.

The function $N(t) = 100e^{-0.023t}$ models the number of grams in a sample of cesium-137 that remain after t years. On which interval is the sample's average rate of decay the fastest?

(1) [1,10]

(3) [15,25]

(2) [10,20]

(4) [1,30]

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Add a Calculator page.

Enter menu, 1, 1 and define the function.

Use the slope formula to find the rate of change over the given interval.

(1) is the correct response.

1.1 ▶	*Doc	RAD ▯ ✕
Define $n(t) = 100 \cdot e^{-0.023 \cdot t}$		*Done*
$\dfrac{n(10)-n(1)}{10-1}$		-2.030
$\dfrac{n(20)-n(10)}{20-10}$		-1.632
$\dfrac{n(25)-n(15)}{25-15}$		-1.455

1.1 ▶	*Doc	RAD ▯ ✕
$\dfrac{n(10)-n(1)}{10-1}$		-2.030
$\dfrac{n(20)-n(10)}{20-10}$		-1.632
$\dfrac{n(25)-n(15)}{25-15}$		-1.455
$\dfrac{n(30)-n(1)}{30-1}$		-1.640