Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Sample Quiz Difference Quotient and ROC Hour\_\_\_\_\_

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| $$f\left(x\right)=2x^{2}-4x$$Use this function to answer the questions on this page.1. Determine the slope of the secant line from x = 3 to x = 4

**SHOW DIFFERENCE QUOTIENT**1. Write the equation of the secant line from x = 3 to x = 4

(CALCULUS DOES NOT USUALLY CARE ABOUT Y INTERCEPT, so use modified point slope format)1. Determine the average rate of change (AROC) from x = 3 to x = 4

**SHOW DIFFERENCE QUOTIENT** | 1. Use x = 3.9999 and x = 4 to APPROXIMATE the instantaneous rate of at x = 4

**SHOW DIFFERENCE QUOTIENT**1. Use x = 4.0001 and x = 4 to APPROXIMATE the instantaneous rate of at x = 4

**SHOW DIFFERENCE QUOTIENT**1. What did #4 and #5 suggest as the APPROXIMATE slope of the tangent line?
2. Write the equation of APPROXIMATE tangent line at

x = 4 |

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|  | Use this graph and the given information below to answer the questions below.A jogger’s distance whole on a run can be modeled by the function depicted on the given graph. f(x) gives the distance the jogger has ran in meters and x gives the number of seconds the jogger has been running for $0\leq x\leq 1800$ seconds  |

1. Sketch the tangent line at x = 600 seconds. DO THIS ON GRAPH ITSELF!
2. Using the given graph and the related points give a rough estimate of the instantaneous rate of change at x = 600 seconds. Give a related difference quotient based on this rough estimate.
3. Give a related difference quotient of a better approximation for f(x) IF YOU KNEW the function for f(x)!
4. Suppose that you knew that this f(x) was, in fact, $f\left(x\right)=115.47\sqrt{x}$ with x measured in seconds and f(x) measured in meters. Give a better estimate of the instantaneous rate of change at x = 600 seconds.

 Give a related difference quotient based on this rough estimate.

The number of graduating seniors at a high schools can be modeled by G, where G(t) is the number of graduating seniors and t is the year since 2005 for $0\leq t\leq 25$

1. What does G(6) represent? (hint: a 4 digit year should be mentioned in the best explanation)
2. What does $\frac{G\left(6\right)-G(1)}{6-1}$ represent? Be specific!
3. What does $\frac{G\left(6\right)-G(5.9999)}{6-5.9999}$ represent? Be specific!

$$f\left(x\right)=2x^{2}-4x$$

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| How do I get the difference quotient on TI Nspire? | Difference quotient Note: this is the difference quotient $\frac{f\left(x\_{2}\right)-f\left(x\_{1}\right)}{x\_{2}-x\_{1}}$In previous classes, we called this SLOPE, in upper-level classes leading to CALCULUS, we use the fancier term, but it is all still about SLOPE or Rate of Change.On the TI Nspire, it should be $\frac{f\_{1}\left(x\_{2}\right)-f\_{1}\left(x\_{1}\right)}{x\_{2}-x\_{1}}$Option 1:1. Define your function on Graphs page.

1. Add a calculator page (Press CTRL i, or press DOC button and INSERT PAGE)

This is CTRL i path or CTRL DOC Button path This is DOC Button path  1. Press CTRL / button to insert a fraction

1. Press VAR button (faster method) or type f1() using keystrokes (slower method) directly to create difference quotient

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| How do I get the difference quotient on TI Nspire?A close-up of a calculator  Description automatically generated | Difference quotient Note: this is the difference quotient $\frac{f\left(x\_{2}\right)-f\left(x\_{1}\right)}{x\_{2}-x\_{1}}$In previous classes, we called this SLOPE, in upper-level classes leading to CALCULUS, we use the fancier term, but it is all still about SLOPE or Rate of Change.On the TI Nspire, it should be $\frac{f\_{1}\left(x\_{2}\right)-f\_{1}\left(x\_{1}\right)}{x\_{2}-x\_{1}}$Option 2:1. Add a calculator page (Press CTRL i, or press DOC button and INSERT PAGE)

This is CTRL i path or CTRL DOC Button path This is DOC Button path A screenshot of a calculator  Description automatically generated A screenshot of a computer  Description automatically generated1. Define your function using := button (this is CTRL and the button immediately to the RIGHT of the 9 button (you know it worked if it says DONE)
2. Press CTRL / button to insert a fraction.
3. Press VAR button (faster method) or type f1() using keystrokes (slower method) directly to create difference quotient

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