(3,45)

5.7

60.72 Î y $f(x) = 3x^3 - 4x^2$ Use this function to answer the questions on this page. $f1(x) = 3 \cdot x^3 - 4 \cdot x^2$ 1. Determine the slope of the secant line from x = 2to x = 3 SHOW DIFFERENCE QUOTIENT (2.8)-1.59 2. Write the equation of the secant line from x = 2to x = 3 -50 (CALCULUS DOES NOT USUALLY CARE ABOUT Y INTERCEPT, so use modified point slope format) 4. Use x = 1.9999 and x = 2 to APPROXIMATE the instantaneous rate of at x = 2SHOW DIFFERENCE QUOTIENT 3. Determine the average rate of change (AROC) from x = 2 to x = 3SHOW DIFFERENCE QUOTIENT

- 5. Use x = 2.0001 and x = 2 to APPROXIMATE the instantaneous rate of at x = 2SHOW DIFFERENCE QUOTIENT
- 6. What did #4 and #5 suggest as the APPROXIMATE slope of the tangent line?
- 7. Write the equation of APPROXIMATE tangent line at x = 2





Use this graph and the given information below to answer the questions below.

The population of a community of wild boar is modeled by the function b, where b(x) gives the number of boar and x gives the number of years since 1990 for $0 \le x \le 30$ years

- 8. Sketch the tangent line at x = 20 years after 1990. DO THIS ON THE GRAPH ITSELF!
- 9. Using the given graph and the related points, give a rough estimate of the instantaneous rate of change at x = 20 years. Give a related difference quotient based on this rough estimate.
- 10. Give a related difference quotient of a better approximation for b(x) IF YOU KNEW the function for b(x)!
- 11. Suppose that you knew that this f(x) was, in fact, $b(x) = 26.3374(1.08447)^x$ with x measured in years and b(x) measured in meters. Give a better estimate of the instantaneous rate of change at x = 20 years. Give a related difference quotient based on this rough estimate.

The number of jobs created in the U.S. for the 2021 economy can be modeled by J, where J(m) is the number of new jobs and m is the month in 2021 for $0 \le m \le 12$

12. What does J(3) represent? (hint: a specific month should be mentioned in the best explanation)

13. What does $\frac{J(8)-J(3)}{8-3}$ represent? Be specific and use units!

14. What does $\frac{J(9)-J(8.9999)}{9-8.9999}$ represent? Be specific and use units!

SA Difference Quotient and ROC BETA Hour___

4.44



- 6. What did #4 and #5 suggest as the APPROXIMATE slope of the tangent line?
- Write the equation of APPROXIMATE tangent line at x = 2

EC: You will receive a bonus point on this assessment IF all digital requirements on Desmos Teacher have been met by Sunday!

Name



Use this graph and the given information below to answer the questions below.

The population of a community of wild boar is modeled by the function b, where b(x) gives the number of boar and x gives the number of years since 1990 for $0 \le x \le 30$ years

- 8. Sketch the tangent line at x = 15 years after 1990. DO THIS ON THE GRAPH ITSELF!
- 9. Using the given graph and the related, points give a rough estimate of the instantaneous rate of change at x = 15 years. Give a related difference quotient based on this rough estimate.
- 10. Give a related difference quotient of a better approximation for b(x) IF YOU KNEW the function for b(x)!
- 11. Suppose that you knew that this f(x) was, in fact, $b(x) = 26.3374(1.08447)^x$ with x measured in years and b(x) measured in meters. Give a better estimate of the instantaneous rate of change at x = 15 years. Give a related difference quotient based on this rough estimate.

A hurricane has formed in the Atlantic Ocean and is headed for Miami. It's distance from Miami can be modeled D, where D(t) is the number of miles from Miami and t is the hours since Monday Morning for $0 \le t \le 96$

12. What does D(50) represent? (hint: a specific hour should be mentioned in the best explanation)

13. What does $\frac{D(40)-D(30)}{40-30}$ represent? Be specific and use units!

14. What does $\frac{D(18)-D(17.9999)}{18-17.9999}$ represent? Be specific and use units!

EC: If you could improve one thing about yourself, what would it be and why?



EC: You will receive a bonus point on this assessment IF all digital requirements on Desmos Teacher have been met by Sunday!



Use this graph and the given information below to answer the questions below.

The population of a community of wild boar is modeled by the function b, where b(x) gives the number of boar and x gives the number of years since 1990 for $0 \le x \le 30$ years

- 8. Sketch the tangent line at x = 25 years after 1990. DO THIS ON THE GRAPH ITSELF!
- 9. Using the given graph and the related points, give a rough estimate of the instantaneous rate of change at x = 25 years. Give a related difference quotient based on this rough estimate.
- 10. Give a related difference quotient of a better approximation for b(x) IF YOU KNEW the function for b(x)!
- 11. Suppose that you knew that this f(x) was, in fact, $b(x) = 26.3374(1.08447)^x$ with x measured in years and b(x) measured in meters. Give a better estimate of the instantaneous rate of change at x = 25 years. Give a related difference quotient based on this rough estimate.

The number of people enlisting in the army each year can be modeled by E, where E(t) is the number of new recruits and t is the years since 1980 for $0 \le t \le 20$

12. What does E(9) represent? (hint: a specific year should be mentioned in the best explanation)

13. What does $\frac{E(10)-E(4)}{10-4}$ represent? Be specific and use units!

14. What does $\frac{E(11)-E(10.9999)}{11-10.9999}$ represent? Be specific and use units!



How do I get the difference **Difference** quotient Note: this is the difference quotient $\frac{f(x_2)-f(x_1)}{x_1}$ quotient on TI Nspire? $x_2 - x_1$ In previous classes, we called this SLOPE, in upper-level classes leading to TI-*nspire* CX CAS CALCULUS, we use the fancier term, but it is all still about SLOPE or Rate of Change. TI-SmartView™ Emulator will be abled when you switch to Handheld On the TI Nspire, it should be $\frac{f_1(x_2)-f_1(x_1)}{x_1}$ Preview. $x_2 - x_1$ 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 RAD 🚺 🔀 RAD 🚺 🗙 *Doc ▽ ◀ 1.1 esc ഹിon 2:Add Graphs Doc 1: Problem 3:Add Geometry 🗹 f1(x)= IB doc -4:Add Lists & Spreadsheet 1: File 2: Page (Ctrl+I) 2: Edit 3: Calculator 105:Add Data & Statistics tab 6:Add Notes 3: View4: Graphs 7:Add Vernier DataQuest™ 4: Insel 5: Geometry Press menu var 5: Page 6: Lists & Spreadsheet -10 8 9 7 6: Refre7: Data & Statistics 7: Setti 8: Notes 4 5 6 8: Logir9: Vernier DataQuest™ 2 3 1 🔓 9: Pres A: Program Editor 0 (-) D E F G ?! Þ 2. Define your function using := button (this is CTRL and the button π, К L M N P immediately to the RIGHT of the 9 button (you know it worked if it says , QRSTU + 0 P X Y Z W DONE) 3. Press CTRL / button to insert a fraction. TI-*nspire* CX CAS 4. Press VAR button (faster method) or type f1() using keystrokes (slower TI-SmartView™ Emulator will be method) directly to create difference quotient enabled when you switch to Handheld Preview < 1.1 1.2 ▶ *Doc 🗢 RAD 🚺 🗙 < 1.1 1.2 ▶ *Doc 🗢 RAD 🚺 🗙 f1(4)–f1(3.9) 11.8 0 4-3.9 this should show up when you press VAR button This is difference This is the value of difference quotient esc ഹിon 2 doc tab k RAD 🚺 🕽 9 *Doc 🗢 7 8 4 6 5 $f_1(x) := 2 \cdot x^2 - 4 \cdot x$ Done 1 2 3 f1(4)-f1(3.9) 11.8 0 . (-) found using CTRL and button to the right of 9 4-3.9 BCDEF EE A ?!⊁ G 9 π. IJKLMN H t. **,** Q RSTU P W X Y Z 🛏 V Texas Instruments