

Slide 1

WRITING INTENSIVE MATH COURSES


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Slide 2

MORE INTERPRETATION AND ANALYSIS! LESS COMPUTATION.



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WHY DO WE WRITE IN MATH COURSES?

- We can informally assess student comprehension by asking them to write out the process behind and reasons for their answers. They have the opportunity to engage with content in order to draw connections and make meaning of what they're learning.
- Gives students who may be weaker in math a chance to boost scores by demonstrating their writing abilities.
- Allows students to use technology (i.e. Microsoft Word, Excel) for most of the writing projects.
- Develop students into becoming better critical and analytical thinkers.
- Offers students an opportunity to write in their disciplines.
- Bonus: Communication skills consistently rank at the top of what employers are looking for in candidates!

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EXAMPLES OF INFORMAL WRITING IN A MATH COURSE

- Brainstorming
- Brain dump
- 1-minute paper
- Exit Ticket
- Fix the mistake
- Think-pair-share
- Write in your own words
- Reflection

Active Learning Techniques Handout Provided



ACTIVITY TIME!



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BRAINSTORMING...

- Probability is used in every day occurrences. Can you and your group come up with places and reasons for using probability in every day life? Why is it important to understand probability in these situations?



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FIX THE MISTAKE...

A mistake has been made. Can you find it?

In complete sentences, write out step-by-step directions on how you would solve this problem and describe the error that was made.

$$\begin{aligned}\frac{7x}{2} - \frac{3x}{8} &= 12 \\ \cancel{\frac{7x}{2}} - \cancel{\frac{3x}{8}} &= 12 \\ 56x - 6x &= 12 \\ \frac{50x}{50} &= \frac{12}{50} \\ x &= \frac{12}{50} = \frac{6}{25}\end{aligned}$$

← Solving equations containing fractions

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WHAT DO YOU THINK IS THE DIFFERENCE BETWEEN INFORMAL AND FORMAL WRITING??

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EXAMPLES OF FORMAL WRITING IN A MATH COURSE

- Essay writing
- Multiple choice questions with explanations to support each answer
- Short answers for math test or homework questions
- Research projects
- Real-world projects

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FIRST DAY OF CLASS — ESSAY WRITING

For this project, you will be writing a minimum 2 page paper (no more than 4 pages!), double spaced, 12-pt Times New Roman font, answering the questions below. In order to receive full credit, all questions must be answered thoroughly. You will be graded on completeness of responses, therefore it is important that you tell your story. Detail is everything! Enjoy this opportunity to share a bit about yourself!

- 1) What has been the most positive experience you have had in either a math class or in a situation relating to math?
- 2) What was the most negative or embarrassing experience you have had in a math class?
- 3) What are some of the factors that might distract you or prevent you from getting a high grade in this course? Why would they distract/prevent you?
- 4) What are the factors that would help you to secure a high grade in this course? Be detailed with your methods of success.

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A DIFFERENT TYPE OF MULTIPLE CHOICE QUESTION

Two researchers are going to take a sample of data from the same population of physics students. Researcher A will select a random sample of students from among all students taking physics. Researcher B's sample will consist only of the students in her class. Both researchers will construct a 95% confidence interval for the mean score on the physics final exam using their own sample data. Which researcher's method has a 95% chance of capturing the true mean of the population of all students taking physics? Give a reason for your answer. (Retrieved from A.R.T.I.S.T. 12/13)

- a. Both methods have a 95% chance of capturing the true mean
- b. Researcher A
- c. Researcher B
- d. Neither

Explanation:

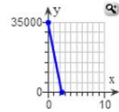
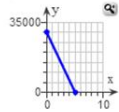
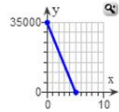
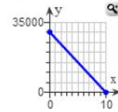
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ANOTHER EXAMPLE OF A MULTIPLE CHOICE QUESTION INVOLVING WRITING.

A new car worth \$30,000 is depreciating in value by \$6000 per year. The mathematical model, which describes the car's value, y , in dollars, after x years, is $y = -6000x + 30,000$.

a. Choose the correct graph below.

☐ A

☐ B

☐ C

☐ D


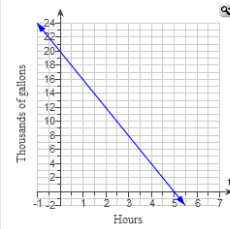
Why did you choose that graph? What evidence helps to support that decision?

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SHORT ANSWER EXAMPLE

Water is steadily pumped out of a flooded basement. Let v be the volume of water (in thousands of gallons) that remains in the basement t hours after the water began to be pumped. A linear model is shown below.



Answer the following questions in complete sentences:

- 1) What is the significance of the t -intercept? The v -intercept?
- 2) What is the slope and what does it mean?
- 3) Using the information you found in parts 1 and 2, what is the equation of the line seen?

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SHORT ANSWER EXAMPLE 2

- In complete sentences, write down the steps you must take in factoring the following polynomial:

$$6x^2 - 15x - 36$$

Possible answer:

Step 1:

The greatest common factor should first be factored from the polynomial.

$$3(2x^2 - 5x - 12)$$

Step 2:

Since it is a trinomial, we can factor using trial and error. We find factors of -24 that combine to give us -5.

(etc...)

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RESEARCH PROJECT

Hypatia is one of the earliest female mathematicians. Write a two page, double-spaced paper on her life and her contributions to mathematics. Further, this writing is expected to be college level - clearly thought-out answers, which are logically organized in complete sentences (and paragraphs), with minimal spelling and grammatical errors.



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RESEARCH PROJECT 2

Directions: For this project, you'll be asking a banker or a financial analyst the following questions. You are to record their answers and type up what you gathered from their information and advice. I will be grading based on thoroughness of answers. You must be detailed to earn full credit for this assignment.

1. Tell me about credit scores. What should I know about destroying or building credit?
2. What about bankruptcy? In what situation would a person consider filing bankruptcy and what are the consequences?
3. How do private loans work? What should I consider when choosing to take out a loan?
4. In your opinion, is it better to rent or own? Why?
5. With respect to purchasing a car, is it better to buy or lease? Why?
6. Tell me about investments I can actually take part in today.
7. If you could go back in time and do things differently, what would you change to become more financially stable? Or what would you change to have had more money saved today?
8. What are the key components of being financially responsible? What things should I do to make sure I have a quality financial future?

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REAL-WORLD PROJECT

Evaluating a loan request:

Samantha Dingledorf wants to buy a house selling for \$175,000. The taxes on the property are \$3500 per year and homeowners' insurance is \$400 per year. Samantha's gross monthly income is \$5000. She has 15 monthly payments of \$450 remaining on her luxury car. The bank is requiring 25% down and is charging 4.5% interest. Her bank will approve a loan that has a total monthly mortgage payment of principal, interest, property taxes, and homeowners' insurance less than or equal to 28% of her adjusted monthly income.

- Determine the required down payment.
- Determine 28% of her adjusted monthly income.
- Determine the monthly payment of principal and interest for a 25-year loan.
- Determine her total monthly payment including homeowners' insurance and taxes.
- Does Samantha qualify for the loan?

You are being asked to send Samantha a memo to let her know why she was approved or why she was denied the loan. If she was denied, you will provide her with a reasonable suggestion so that she can be approved for the loan. Remember, you don't simply want to say, "Sorry no luck!" You will want to help Samantha get this house! You will need to be detailed in how you reached your decision including all computations and intermediate steps.

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REAL-WORLD PROJECT 2

Find an example of a deceptive advertisement. Include the image with your explanation as to why it would be considered deceptive. Be sure to be as detailed as possible.

Answer the following questions in your explanation:

- What is the population of interest?
- What is the competing product? In other words, who is the company trying to lure people away from?
- What point is the advertisement trying to get across to the population of interest?
- How is the advertisement deceptive?
- Were you deceived by the advertisement?? Why or why not?

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REFLECTION (INFORMAL ACTIVITY)

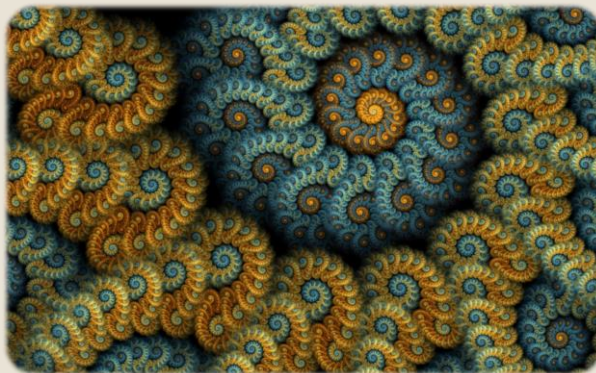
Reflect on what we talked about today and write down one writing activity that you can use for your classes this semester.



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ANY QUESTIONS??



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