

Show Your Work 2

Write a careful, well-organized, neat, complete solution for the problem below and submit your write-up according to the **Directions for Submitting Written Assignments** housed in the **Orientation to MATH 098** module.

☞ Your analysis for the problems below will be graded on the correctness of your answer (this is worth at most 10% of the problem's value) and your ability to communicate the algebra and precalculus steps that you perform to obtain your solution. Each complete step must logically follow from the step that precedes it. You do not have to show arithmetic. Please work with exact numbers. Use the exact and simplified forms of all irrational numbers (do not convert them to a decimal approximation). For example, work with $2\sqrt{2}$ instead of 2.83 and, work with 3π instead of 9.4248. Reduce fractional forms of all rational numbers to lowest terms. Do not use mixed fractions (e.g. $13\frac{2}{3}$). If you choose to convert rational numbers to their decimal equivalent, be sure to include all the digits; use a bar over the set of repeating digits in cases involving a repeating decimal. For example, work with $25/6$ or $4.\overline{16}$ instead of $125/30$ and/or $4\frac{1}{6}$ and work with $11/7$ or $1.\overline{571428}$ instead of $99/63$ or $1\frac{4}{7}$.

Use algebra to address each of the following problems; submit your complete, clearly-communicated solutions.

1. Matthew is driving from Seattle to Spokane. He leaves Seattle at 8 AM and he drives at the constant speed of 70 mph for the entire 280-mile trip. Suppose d represents Matthew's distance (in miles) from Spokane t hours after 8 AM. Find a model of the situation. That is, write an equation which relates the variables d and t .
2. A person fills up her car's 20-gallon gasoline tank and she drives at a constant rate of 60 mph. For each hour of This problem involves two lines, *Line 1* and *Line 2*.

Line 1 passes through the points $(-2, -1)$ and $(0, -2)$.

Line 2 passes through the points $(0, 3)$ and it is perpendicular to *Line 1*.

Find equations for both *Line 1* and *Line 2*.



Make sure that each line in the body of your write-up is a complete step that logically follows from the one before it. [See the next page for an example of two different write-ups, one poorly written, one well-written.]

Here are two different write-ups for the same problem: Is $(10,3)$ a solution of the equation $2y = \frac{1}{5}x - 6$?

WRITE-UP #1

$$2y = \frac{1}{5}(10) - 6 = 2 - 6 = -4 = -4/2$$

-2

No.

Why This is Poorly Written

- You don't know what problem the writer was solving.
- You can't tell what's an assumption and what's a conclusion.
- Where does one thought end and another begin?
- In the 1st line: combining two thoughts can create untruths ($2-6$ is -4 , but it isn't $-4/2$).
- The 2nd line dangles; what's being asserted here? It's not a sentence since there's no verb. Did the writer mean to write the sentence $2y = -2$ or the sentence $y = -2$?

WRITE-UP #2

Plugging-in $x=10$ to see what y equals will allow us to determine if $x=10$, $y=3$ (e.g. $(10,3)$) is a solution of the equation.

With $x=10$, $2y = \frac{1}{5}x - 6$ becomes $2y = \frac{1}{5}(10) - 6$

$$\Rightarrow 2y = 2 - 6$$

$$\Rightarrow 2y = -4$$

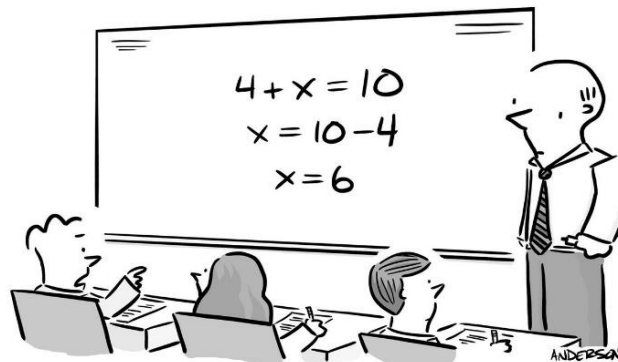
$$\Rightarrow 2y/2 = -4/2$$

Answer: No, $(10,3)$ is not a solution of $2y = \frac{1}{5}x - 6$ since $y = -2$ (not 3) when $x=10$.

Why This is Well-Written

- The writer described the problem, and strategy for its solution.
- Every thought is a complete sentence with subject and verb (the 'equals' sign is a verb).
- Every line of the analysis logically follows from the one that comes before it in the write-up. There are no untruths such as a statement like $-4 = -2$.
- The answer is clearly communicated by the author's use of the word 'Answer'.
- The writer made important ingredients clear, displayed important steps, and presented them in a logical, easy-to-follow manner.

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"Hold on. When we learned Roman numerals, X was 10. Now it's 6. What's going on around here?!"

