MATH 210
EXAMPLE WRITING ASSIGNMENT

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Problem (Page 42 #30)**.** *Pove that two straight lines with different slopes intersect.*

Solution. First consider the case where one line is vertical, say with equation $x = a$. The other line cannot be vertical so it has an equation of the form $y = mx + b$. Then the two lines intersect at the point $(a, ma + b)$.

Now consider the case where neither line is vertical. Say the first line is given by the equation $y = mx + b$ and the second line is given by the equation $y = nx + c$, where $m \neq n$. Any point (x, y) where they intersect must satisfy the equation

$$mx + b = nx + c.$$

Some algebra lets us rewrite the equation as

$$x = \frac{c - b}{m - n},$$

where we can form the fraction because $m - n \neq 0$, which in turn is because $m \neq n$. Thus we have seen that the lines intersect at the point $(\frac{c-b}{m-n}, m \cdot \frac{c-b}{m-n} + b)$, as desired. □

Comments

- Your writing exercises should take the form of short essays with mathematical formulas mixed in. You are explaining the logical steps to see why some bit of math is true.
- You should write in complete sentences. When you write with math symbols, read the sentence out loud to make sure it makes grammatical sense. Sometimes symbols are taking the place of the noun or verb of the sentence.
- Pitch your explanation as going to a classmate. You can assume they know the stuff we've covered in class, and you don't need to re-explain that.
- You don't need to show every little step in a calculation. Instead, focus on the key steps.
- It's good practice to clearly state the mathematical statement you are explaining before the explanation. In mathematics the precise wording of a statement really matters, so it's good to be unambiguous.