



Writing Solutions



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Today we will learn how to write solutions using LaTeX for computational problems.

1 General Tips

Try to make your solution **easy to read**. For example, this means that you should

- Use plenty of space. Put each important equation on its own line.
- Define variables when appropriate.
- Clearly separate and label cases when doing casework.

For more detailed tips, I would recommend reading [How to Write a Math Solution](#) (note that this article focuses on how to write proofs).

2 Summary of Important LaTeX

- In in-line math mode, enclose the math with $...$ signs.
- In display math mode, enclose the math with
$$...$$
 signs or with
$$\left[\right]$$
 and
$$\backslash$$
.
- For multiplication, usually you use \cdot , but sometimes you may want \times .
- For fractions, use $\frac{\text{numerator}}{\text{denominator}}$.
- Use $\sqrt{\text{expression}}$ for square roots, and $\sqrt[n]{\text{expression}}$ for n th roots.
- For exponents, use $^$. For subscripts, use an underscore (shift+minus sign).
- To align multiple equations, use
$$\begin{aligned} & \text{equation 1} \\ & \text{equation 2} \\ & \text{equation 3} \end{aligned}$$
 and
$$\end{aligned}$$
. Within each equation, use $\&$ before what you want to align (usually the equals or inequality sign). Put each equation on its own line and add
$$\backslash$$
 at the end of each line (except the last one).



3 Resources

- The [AoPS Wiki](#) has a LaTeX tutorial and commonly used symbols.
- You can draw a symbol on <http://detexify.kirelabs.org/> to figure out how to write it in LaTeX.
- You can write in LaTeX on AoPS forums. If you would like to pre-write a solution, you can try using [AoPS TeXeR](#) or an AoPS private message to yourself.

4 Let's Practice!

We're going to practice writing solutions to some Purple Comet problems. I'll first show you how to solve and write up the solution to [2016 MS #13](#) and [2016 HS #15](#).

Now here are some Purple Comet problems you can write solutions to.

- [2017 MS #4](#)
- [2017 MS #6](#)
- [2017 MS #8](#)
- [2016 MS #11](#)
- [2018 HS #2](#)
- [2018 HS #5](#)
- [2018 HS #7](#)