# M1C03 Lecture 6

*Problem solving and communication*

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# Announcement(s)

1. Assignment 1 due Friday
2. Quiz 2 due Friday

# Overview

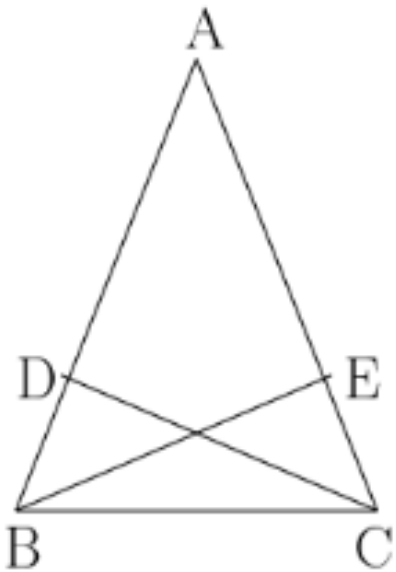
*In math we use deductive reasoning to justify claims about mathematical objects.*

This process has two modes: *communicating* and *problem solving*.

Experience is the best way to improve.

# Example

$ABC$ is an isosceles triangle in which $AB = AC$. Points $D$ and $E$ are taken on $AB$ and $AC$, respectively, such that $BD = CE$. Prove that $BE = CD$.



# Some problem solving strategies

- Understand what is given, definitions, what you can use, how the math works.
- Understand the goal.
- Work forwards: what follows from what is given?
- Work backwards: what would imply the goal?
- Reduce the problem into sub-problems.
- Be patient.
- Be critical.

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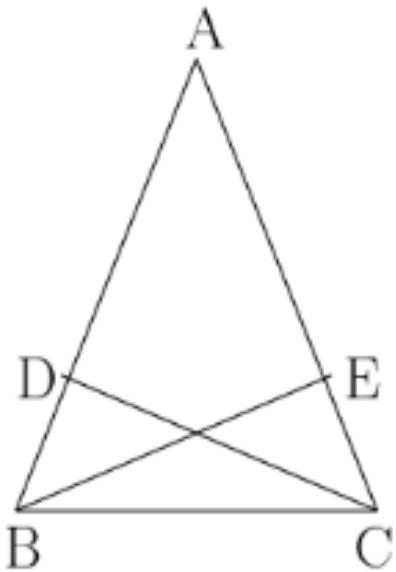

# Practical tips for communicating (in writing)

- Start with a rough outline and fill in the details.
- Tell the reader what you are about to do.
- Always give the assumptions at the beginning.
- Justify your steps with logic and use complete sentences.
- Provide the reader with a reference to any facts you are using from elsewhere.
- End with the conclusion.
- Read out loud, get feedback, revise.
- Be critical.

Reference for writing math (aka communicating): Lakins, pp. 209 – 210.

# Things to consider when communicating

- Audience.
- Context.
- Medium.
- Respect/humanity.

# Example

The medians $BE$ and $CF$ of $\triangle ABC$ are extended to $K$ and $L$, respectively, so that $EK = BE$ and $LF = CF$. Prove that $K$, $A$, and $L$ lie in a straight line.

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