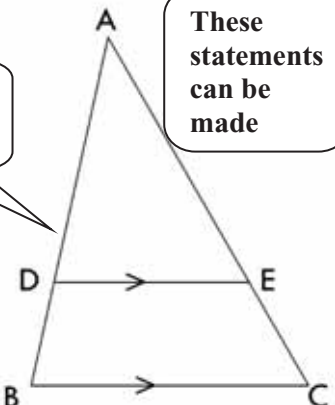Triangle **Proportionality Theorem**.
If a line parallel to one side of a triangle intersects the other two sides of the triangle, then the line divides these two sides **proportionally**.

**Given:**

These statements can be made

**Statement**          **Reason**

The theorem is the reason,

$$\frac{AD}{DB} = \frac{AE}{EC}$$          prop theorem   DE $\parallel$ BC

The proportionality theorem written as a reason in short.

$$\frac{AB}{DB} = \frac{AC}{EC}$$          prop theorem   DE || BC

$$\frac{AD}{AB} = \frac{AE}{AC}$$          prop theorem   DE || BC

## SPECIAL CASE OF THE CONVERSE PROPORTIONALITY THEOREM: THE MID-POINT THEOREM

A corollary of the proportion theorem is the mid-point theorem: the line joining the mid-points of two sides of a triangle is parallel to the third side and equal to half the length of the third side.
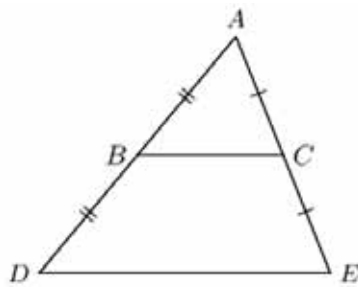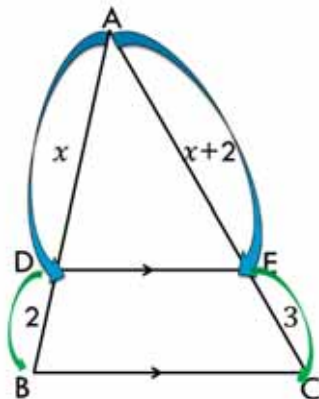
If AB = BD and AC = CE, then BC||DE and
BC = ½DE.

We also know that $\dfrac{AC}{CE} = \dfrac{AB}{BD}$

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**APPLYING THE PROPRTIONALITY THEOREM:**
**EXAMPLE 1**
In the diagram below, ΔABC has D on AB and E on AC such that DE || BC.
DB = 2 units, EC = 3 units, AD = $x$ units and AE = $x + 2$ units.
Determine the value of $x$.

**Statement**          **Reason**

$$\frac{AD}{DB} = \frac{AE}{EC}$$          prop theorem   DE $\parallel$ BC

$$\frac{x}{2} = \frac{x+2}{3}$$

$$2(x + 2) = 3x$$
$$2x + 4 = 3x$$
$$4 = x$$