EB Education Revision Guide

BELIEVE YOU CAN
and you're halfway there

Theodore Roosevelt —
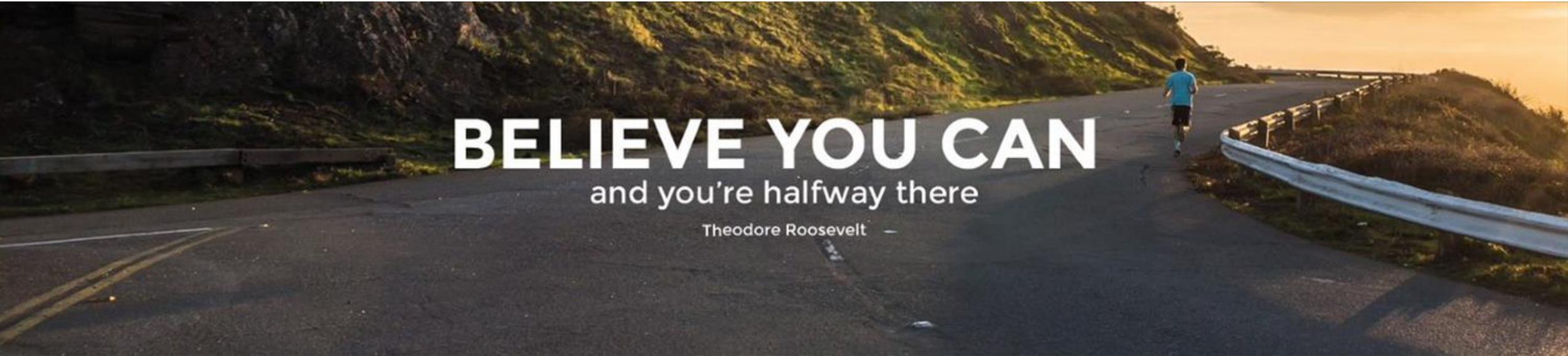
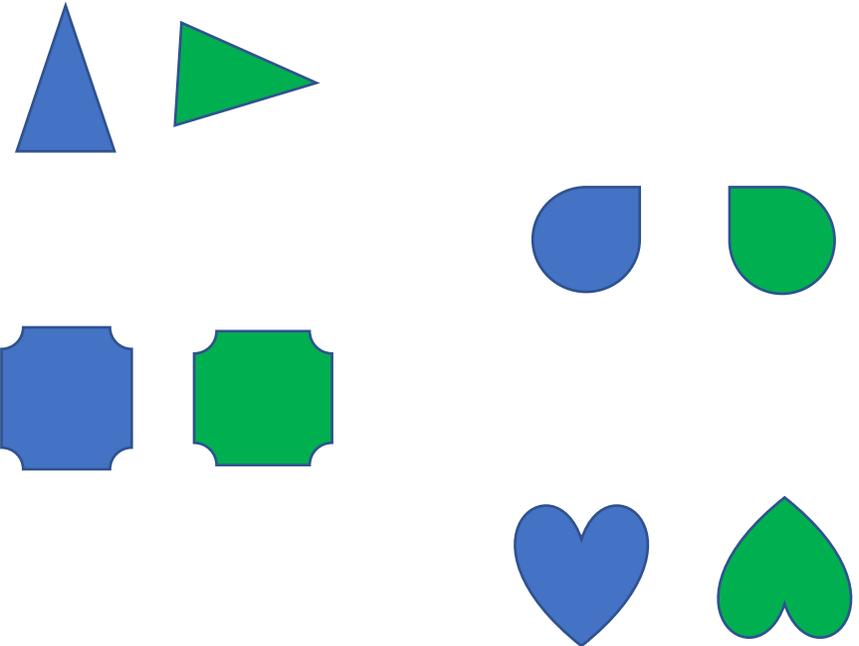## How to work with Shapes: Part 2

Congruent Shapes

What are they?

Congruent shapes are:

- Exactly the same size

- Exactly the same shape

They can be rotated or be mirror images.

Examples.

Congruent Triangles

Two triangles are congruent if one of these conditions is true:

- SSS   All three sides are the same length in both triangles (this means all three angles are the same too)

- SAS   Two sides, and the angle between them are the same in both triangles

- AAS   Two angles and a corresponding side are the same in both triangles

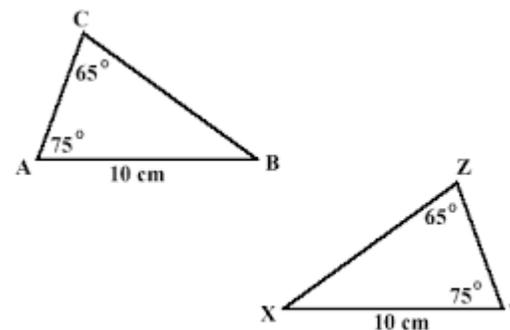- RHS   Both triangles have a right angle, matching hypotenuse, and one other matching side.

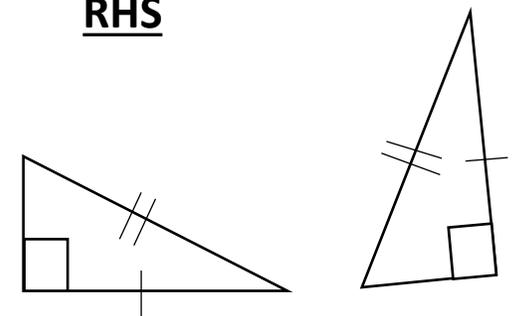**SSS**
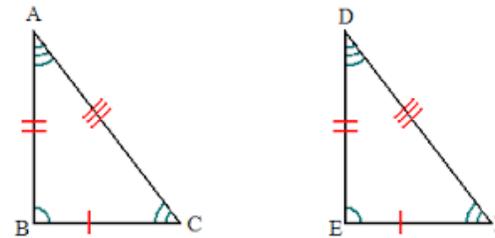
SAS
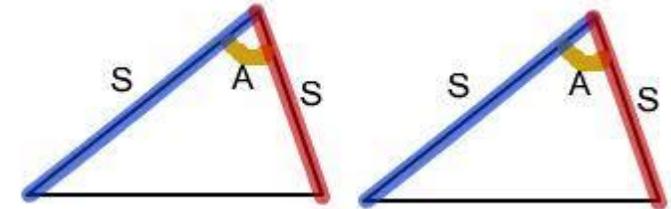
AAS

RHS

TOP TIP: Tick marks or lines indicate sides of a shape that have equal length.

...helping everybody achieve Even Better

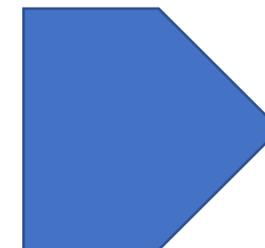**Education Services Ltd**

What are they?

Similar shapes are exactly the same shape, BUT they can be:

- Different sizes

- Rotated

- Reflected

Similar shapes will have the same sized angles and the sides will be proportional.

Examples:

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Similar Triangles
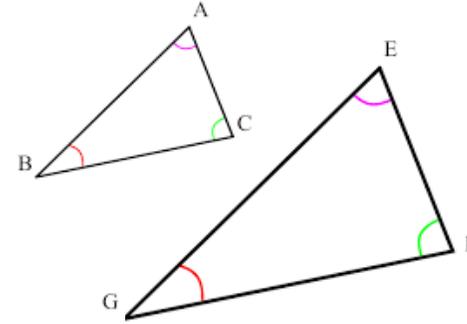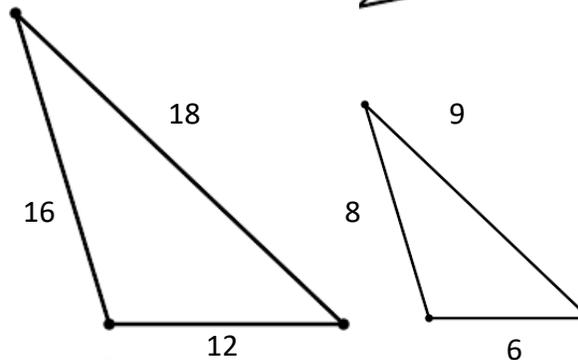
Triangles are similar if one of these conditions is true:

- All the angles match up

- All three sides are proportional

- Two sides are proportional and the angle between them is the same.

The angles are the same in both triangles.

The sides are proportional: 6:12, 8:16, 9:18 - they are all doubled.
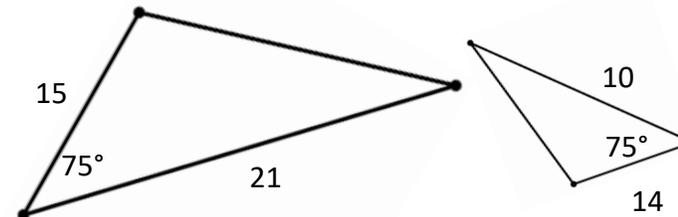
The sides are proportional: 10:15, 14:21(2:3), and the angle between them is the same.

Using the rules

Example:

B

A

C

D
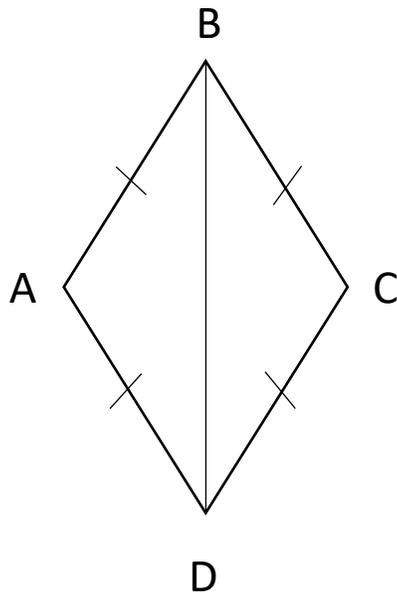
AB = BC = CD = DA
Prove that the triangle ADB is
congruent to the triangle CDB

How to do it:

AB = BC

(this is shown on the diagram)

AD = BC

(this is show on the diagram)

BD is the same in both triangles

SSS – therefore triangles are congruent

1. ABC is an equilateral triangle. D lies on BC.
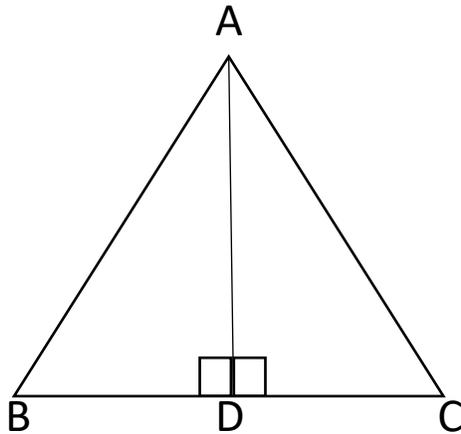AD is perpendicular to BC.

a) Prove that triangle ADC is congruent to triangle ADB

b) Prove that BD= ½ AB

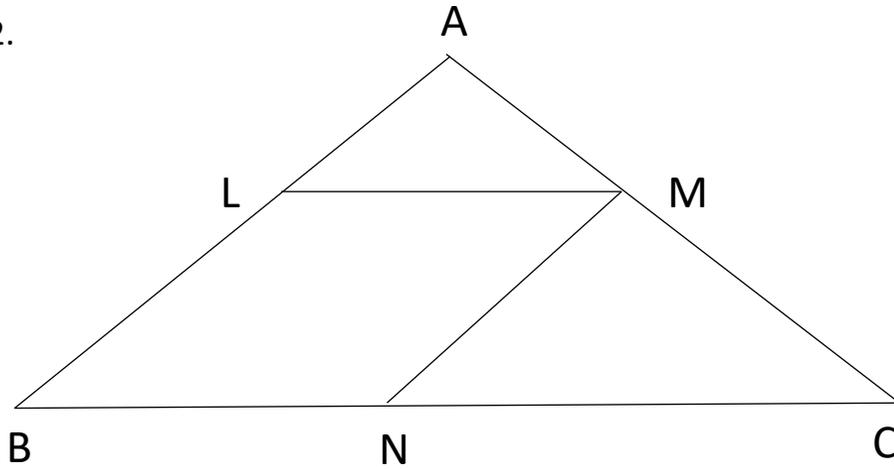...

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2.

The diagram above shows a triangle ABC.

LMNB is a parallelogram where
L is the midpoint of AB,
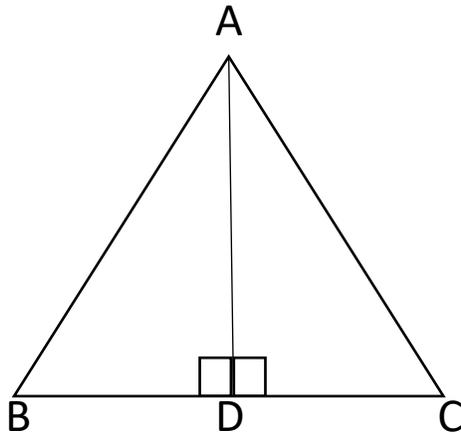M is the midpoint of AC,
N is the midpoint of BC.

Prove that triangle ALM and MNC are congruent.
Give reasons for each stage of your answer.

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1. ABC is an equilateral triangle. D lies on BC.
AD is perpendicular to BC.

a) Prove that triangle ADC is congruent to triangle ADB

AD is common in both triangles
Angle ADC = angle ADB – both are 90°
AB = AC as sides in an equilateral triangle are equal
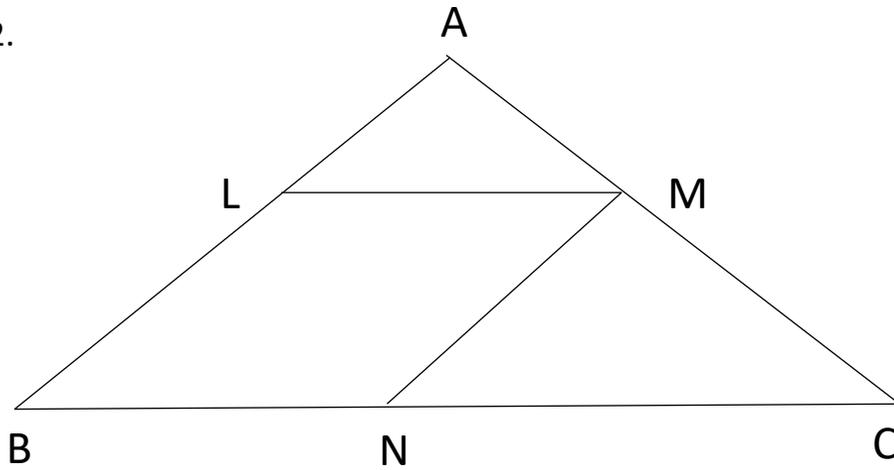RHS therefore triangles are congruent

b) Prove that BD= ½ AB

BD + CD = BC
As the triangle are congruent   BD = CD = ½ BC

BC = AB as equilateral therefore BD = ½ AB

2.

The diagram above shows a triangle ABC.

LMNB is a parallelogram where
L is the midpoint of AB,
M is the midpoint of AC,
N is the midpoint of BC.

Prove that triangle ALM and MNC are congruent.
Give reasons for each stage of your answer.

BL = AL   L is the midpoint
BL = MN   They are opposite sides in a parallelogram
AL = MN

BN = CN   N is the midpoint
BN = LM   They are opposite sides in a parallelogram
CN = LM

AM = MC   M is the midpoint

SSS therefore triangles are congruent

For more help and resources, or to work with us as a tutor, please contact us

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