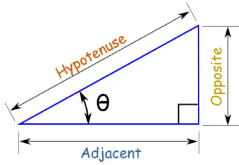


Trigonometric Functions

$$\sin \theta = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

$$\cos \theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

$$\tan \theta = \frac{\text{Opposite}}{\text{Adjacent}}$$



*adjacent and opposite labels can change depending on the angle being found

Pythagoras Theorem

$$c^2 = a^2 + b^2 \quad c = \sqrt{a^2 + b^2}$$

$$a^2 = c^2 - b^2 \quad a = \sqrt{c^2 - b^2}$$

$$b^2 = c^2 - a^2 \quad b = \sqrt{c^2 - a^2}$$

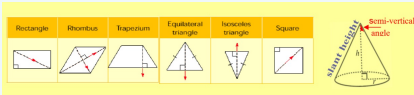
c is the hypotenuse whereas a and b can be switched interchangeably

Pythagoras in 3 Dimensions

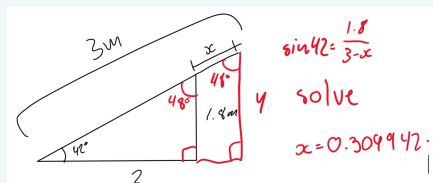
The Pythagorean Theorem can also be used in three dimensions to find the diagonal length of a rectangular prism

$$d = \sqrt{x^2 + y^2 + z^2}$$

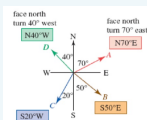
Finding right angles in general shapes



Example X



True Bearings



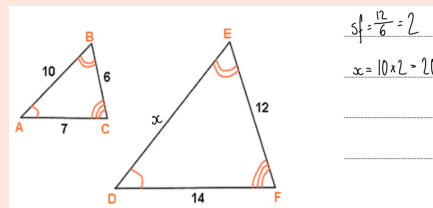
Similarity Test for Similar Triangles

Scale Factor

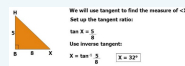
Scale factor is the ratio between the scale of a given original object and a new object, which is its representation but of a different size (bigger or smaller).

$$sf = \frac{\text{larger figure dimensions}}{\text{smaller figure dimensions}}$$

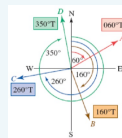
Example of Scale Factor



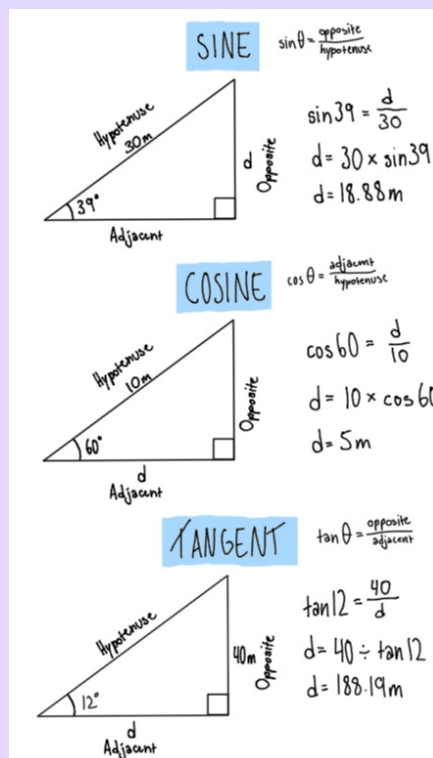
Example of Inverse



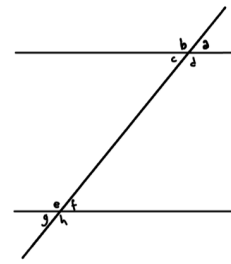
Conventional Bearings



Examples of Trigonometric functions



Examples of Angles

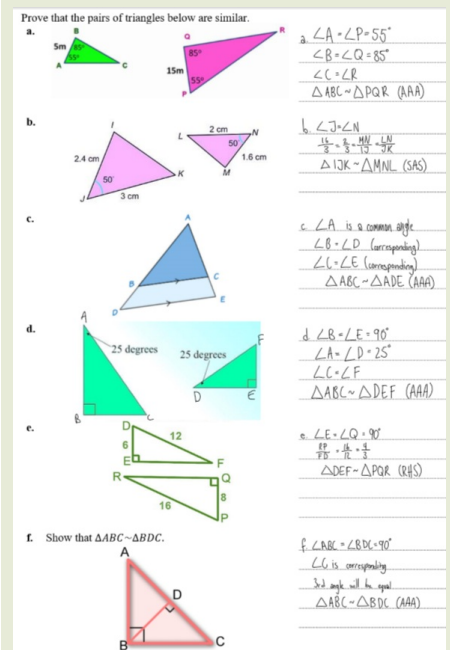


a = c = f = g
b = d = e = h
corresponding:
a & f
b & e
c & h
d & g
alternate:
d & e
c & f

Corresponding: Equal the same

Alternate: Equals 180

Examples of Similar Triangles



AAA Rule

$\angle A = \angle D = 65^\circ$
 $\angle B = \angle E = 75^\circ$
 $\angle C = \angle F = 40^\circ$

$\triangle ABC \sim \triangle DEF$
by the **AAA** Rule.

SSS Rule

$\frac{AB}{DE} = \frac{10}{5} = 2$
 $\frac{BC}{EF} = \frac{16}{8} = 2$
 $\frac{AC}{DF} = \frac{12}{6} = 2$

$\triangle ABC \sim \triangle DEF$
by the **SSS** Rule.

SAS Rule

$\frac{BC}{EF} = \frac{16}{8} = 2$
 $\angle C = \angle F = 40^\circ$
 $\frac{AC}{DF} = \frac{12}{6} = 2$

$\triangle ABC \sim \triangle DEF$
by the **SAS** Rule.

RHS Rule

$\angle A = \angle D = 90^\circ$
 $\frac{BC}{EF} = \frac{10}{5} = 2$
 $\frac{AB}{DE} = \frac{8}{4} = 2$

$\triangle ABC \sim \triangle DEF$
by the **RHS** Rule.



By **enfoiree** (enfoiree_)
cheatography.com/enfoiree/

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