

# Cheatsography

## Trigonometry Year 10 Cheat Sheet

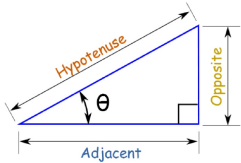
by enfoiree (enfoiree\_) via [cheatsography.com/166759/cs/34910/](http://cheatsography.com/166759/cs/34910/)

### 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

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

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

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

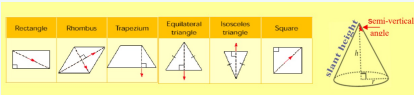
c is the hypotenuse whereas a and b can be switched interchangeably

### Pythagoras in 3 Dimensions

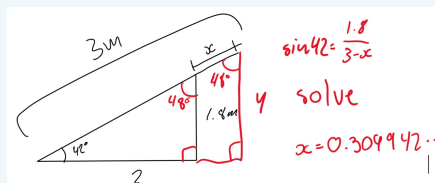
The Pythagorean Theorem can also be used in three dimensions to find the diagonal length of a rectangular prism

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

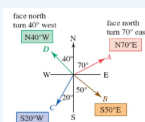
### Finding right angles in general shapes



### Example X



### True Bearings



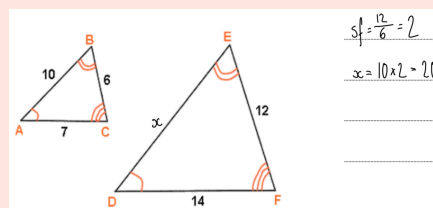
### Similarity Test for Similar Triangles

### Scale Factor

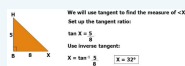
Scale factor is the ratio between the scale of a given original object and a new object, which is its representation but of a different size (bigger or smaller).

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

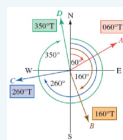
### Example of Scale Factor



### Example of Inverse



### Conventional Bearings



### Examples of Trigonometric functions

**SINE**  $\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$

$$\sin 39 = \frac{d}{30}$$

$$d = 30 \times \sin 39$$

$$d = 18.88 \text{ m}$$

**COSINE**  $\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$

$$\cos 60 = \frac{d}{10}$$

$$d = 10 \times \cos 60$$

$$d = 5 \text{ m}$$

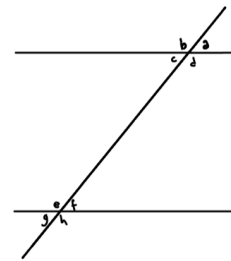
**TANGENT**  $\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$

$$\tan 12 = \frac{40}{d}$$

$$d = 40 \div \tan 12$$

$$d = 188.19 \text{ m}$$

### Examples of Angles



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

Corresponding: Equal the same

Alternate: Equals 180

### Examples of Similar Triangles

Prove that the pairs of triangles below are similar.

a.

b.

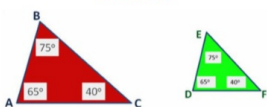
c.

d.

e.

f. Show that  $\triangle ABC \sim \triangle BDC$ .

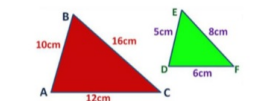
**AAA Rule**



$\angle A = \angle D = 65^\circ$   
 $\angle B = \angle E = 75^\circ$   
 $\angle C = \angle F = 40^\circ$   
 $\triangle ABC \sim \triangle DEF$   
 by the **AAA** Rule.

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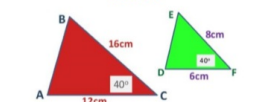
**SSS Rule**



$\frac{AB}{DE} = \frac{10}{5} = 2$   
 $\frac{BC}{EF} = \frac{16}{8} = 2$   
 $\frac{AC}{DF} = \frac{12}{6} = 2$   
 $\triangle ABC \sim \triangle DEF$   
 by the **SSS** Rule.

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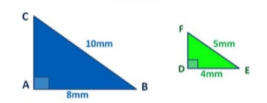
**SAS Rule**



$\frac{BC}{EF} = \frac{16}{8} = 2$   
 $\angle C = \angle F = 40^\circ$   
 $\frac{AC}{DF} = \frac{12}{6} = 2$   
 $\triangle ABC \sim \triangle DEF$   
 by the **SAS** Rule.

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**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.



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