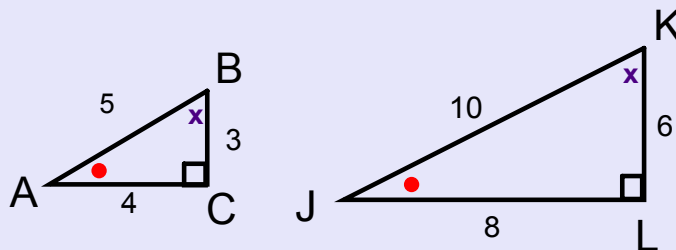
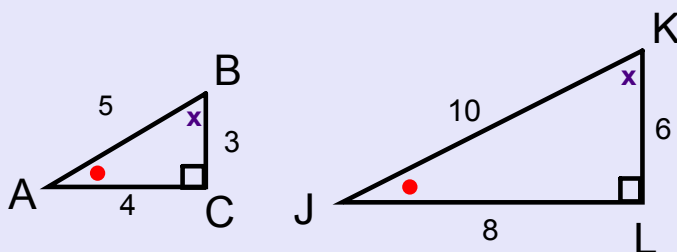


With similar triangles, the ratios of corresponding sides are equal, and corresponding angles are equal.

$$\triangle ABC \sim \triangle JKL$$



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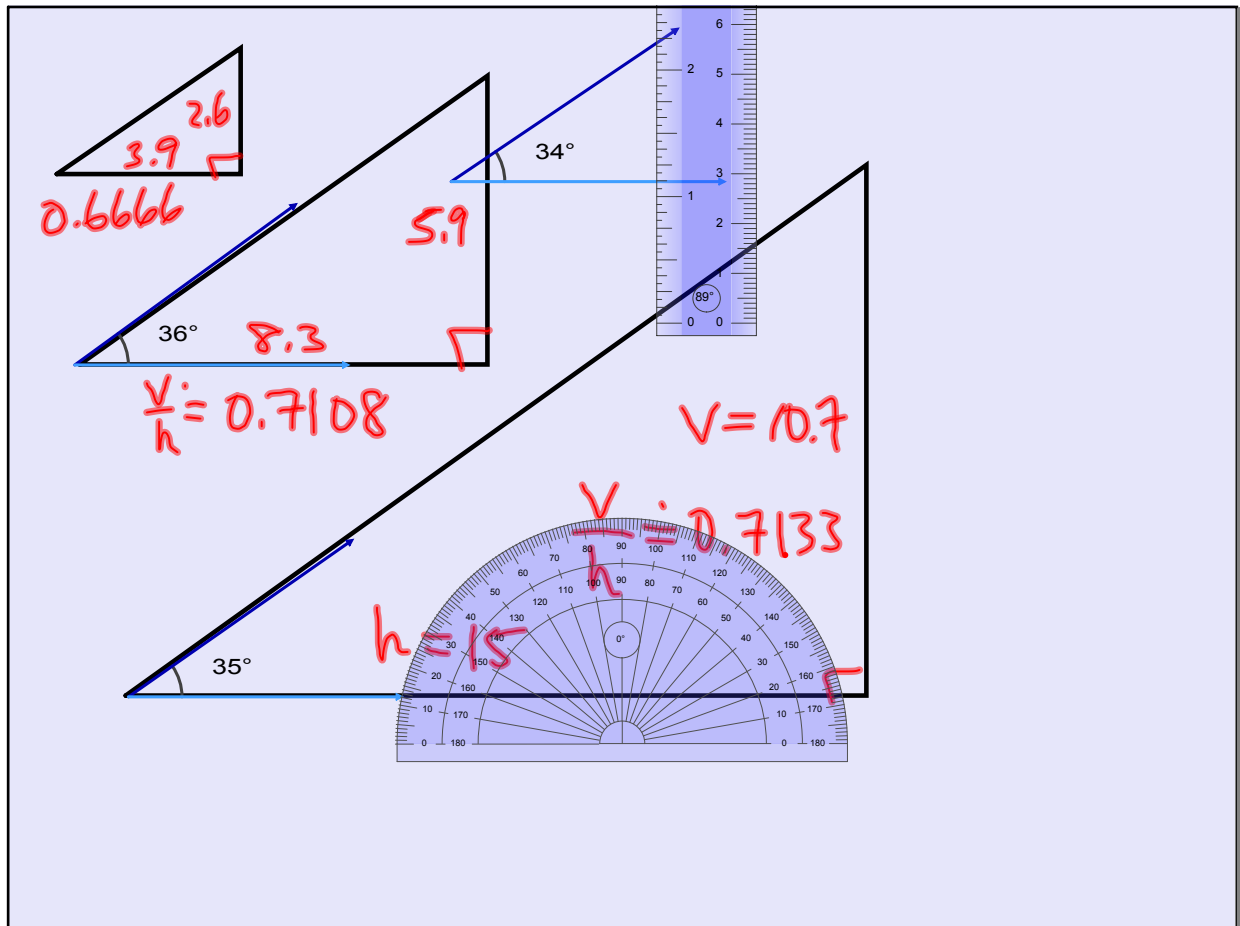


What happens when we calculate ratios for sides within each triangle?

e.g., $\frac{BC}{AC} = 0.75$ $\frac{KL}{JL} = 0.75$

In right-triangles, the ratios of sides are related to the angles. When matching ratios are equal, the angles are equal.

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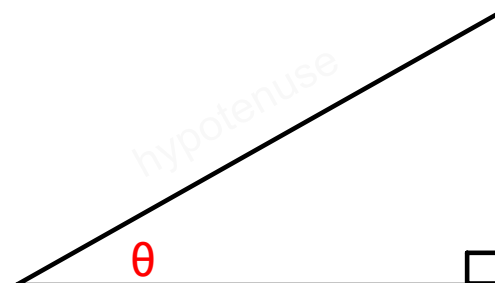
May 19-8:14 PM

Trigonometric Ratios

may 20/2010

To be consistent when finding ratios for a right-triangle, the sides have to be identified with respect to the angle of interest (never the 90° angle).

θ is the Greek letter "theta"



hypotenuse

opposite to θ

adjacent to θ

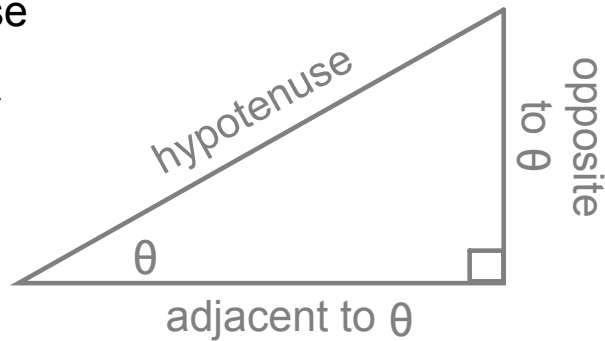
Dec 7-9:58 PM

For any angle of interest, there are three (3) primary trigonometric ratios.

$$\text{sine of } \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\text{cosine of } \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\text{tangent of } \theta = \frac{\text{opposite}}{\text{adjacent}}$$



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To remember the trigonometric ratios:

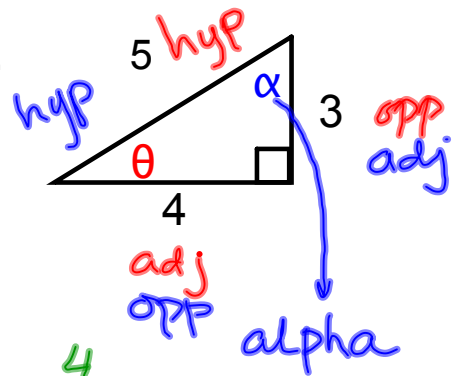
S o h C a h T o a

$$\sin \theta = \frac{o}{h} \quad \cos \theta = \frac{a}{h} \quad \tan \theta = \frac{o}{a}$$

A mnemonic is a memory device

Dec 8-10:24 PM

Ex.1 Find the trig ratios for θ and α .
Are the angles equal?



$$\sin \theta = \frac{o}{h} = \frac{3}{5}$$

$$\cos \theta = \frac{a}{h} = \frac{4}{5}$$

$$\tan \theta = \frac{o}{a} = \frac{3}{4}$$

$$\sin \alpha = \frac{4}{5}$$

$$\cos \alpha = \frac{3}{5}$$

$$\tan \alpha = \frac{4}{3}$$

$\therefore \theta \neq \alpha$

because corresponding ratios are not equal.

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The study of the ratios of triangle sides dates back as far as 140 BCE, with the Greek mathematician Hipparchus.

There are 6 possible ratios for each triangle. The most important form the three primary trigonometric ratios.

The decimal value of each trigonometric ratio corresponds to a particular angle.

Handout: Trigonometric Table

Dec 7-10:11 PM

We can also determine a trigonometric ratio from a given angle.

Ex.2 Use a calculator or trig table to determine:

$$\sin 30^\circ = 0.5$$

$$\cos 30^\circ = 0.8660$$

$$\tan 30^\circ = 0.5773$$

$$30 \boxed{\sin}$$

$$\boxed{\sin}(30)$$

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Ex.3 Solve

$$\cos 70^\circ = \frac{x}{15} \quad [\times 15]$$

$$15 \cos 70^\circ = x$$

$$15(0.3420) = x$$

$$5.130 = x$$

$$\boxed{x \doteq 5.1}$$

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Homework: p.496 # 2, 4, 6, 9, 10

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Attachments

MPM 2D (L39- Scale Factor (GSP)).gsp

02 Scale Factor - GSP.gsp