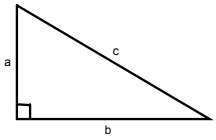
Pythagorean Theorem and Trigonometry Intro

Mar 8-10:52 AM

Pythagorean Theorem

If right triangle, then $a^2 + b^2 = c^2$ (c is the hypotenuse)



$a^2 + b^2 = c^2$

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Find the missing side in simplest radical form.

Where do we put each given length?

1. a = 4 b = 10 $4^2 + 10^2 = c^2$, $16 + 100$, $\sqrt{c^2} = \sqrt{116}$, $c = 2\sqrt{29}$

2. a = 5 c = 11 $5^2 + b^2 = 11^2$, $25 + b^2 = 121$, $-25 \quad -25$, $\sqrt{b^2} = \sqrt{96}$, $4\sqrt{6}$

Which side is the hypotenuse?

3. b = 7 c = 10 $a^2 + 7^2 = 10^2$, $a^2 + 49 = 100$, $-49 \quad -49$, $\sqrt{a^2} = \sqrt{51}$, $a = \sqrt{51}$

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Trigonometric Ratios

A ~~trigonometric ratio~~ is a ratio of two sides of a ~~right triangle~~!!

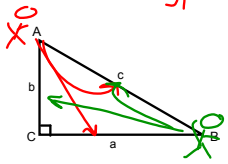
Sine (sin) is the ratio of the length of the leg opposite the angle to the length of the hypotnuse.

SOH CAH TOA

Sin = opp/hyp Cos = adj/hyp Tan = opp/adj

$\sin A = \frac{\text{opposite leg}}{\text{hypotenuse}} = \frac{a}{c}$

$\sin B = \frac{\text{opposite leg}}{\text{hypotenuse}} = \frac{b}{c}$



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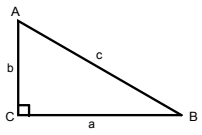
~~Cosine (cos)~~ is the ratio of the length of the leg adjacent to the angle to the length of the hypotnuse.

$\cos A = \frac{\text{adjacent leg}}{\text{hypotenuse}} = \frac{b}{c}$



~~Tangent (tan)~~ is the ratio of the length of the leg opposite the angle to the length leg adjacent to the angle.

$\tan B = \frac{\text{opposite leg}}{\text{adjacent leg}} = \frac{b}{a}$

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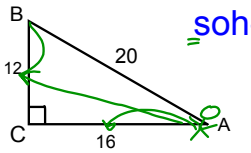
Given the following right triangle set up the following trigonometry ratios.

Where do we "stand" to find each ratio?

4.



soh-cah-toa

$\sin A = \frac{12}{20} = \frac{3}{5}$ $\sin B = \frac{4}{5}$

$\cos A = \frac{16}{20} = \frac{4}{5}$ $\cos B = \frac{12}{20} = \frac{3}{5}$

$\tan A = \frac{12}{16} = \frac{3}{4}$ $\tan B = \frac{4}{3}$

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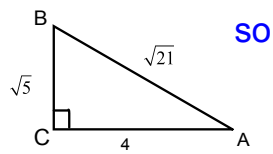
5. soh-cah-toa



Where do we "stand" to find each ratio?

$\frac{4}{\sqrt{21}}$

sin A = $\frac{\sqrt{5}}{\sqrt{21}} \cdot \frac{\sqrt{21}}{\sqrt{21}} = \frac{\sqrt{105}}{21}$

sin B = $\frac{4}{\sqrt{21}} \cdot \frac{\sqrt{21}}{\sqrt{21}} = \frac{4\sqrt{21}}{21}$

cos A = $\frac{4\sqrt{21}}{21}$

cos B = $\frac{\sqrt{105}}{21}$

tan A = $\frac{\sqrt{5}}{4}$

tan B = $\frac{4\sqrt{5}}{5}$

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$\sqrt{60}$ $\sqrt{60}$ $(\sqrt{6})^2$ $\sqrt{6^2}$ $(2\sqrt{3})^2$

$\sqrt{4}\sqrt{15}$ $6 \cdot 10$ 6 $2\sqrt{3} \cdot 2\sqrt{3}$

$2\sqrt{15}$ $2 \cdot 3 \cdot 5$ $4\sqrt{9}$

$2\sqrt{15}$ $4 \cdot 3$

$\sqrt{4^2+9^2}$ 12

$\sqrt{16+81}$

$\sqrt{}$

Mar 24-1:33 PM

$a^2 + b^2 = c^2$

soh-cah-toa

Assignment:

Pythagorean Theorem and Intro to Trig Worksheet

Mar 8-12:02 PM

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