Guiding Question: Can I apply my knowledge of trigonometry to solve triangles?

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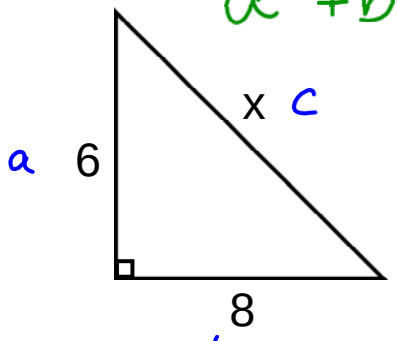
Solve for the unknown sides:

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

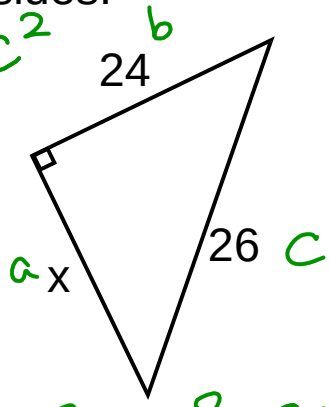


b

$6^2+8^2=x^2$

$100=x^2$

$10=x$



$x^2+24^2=26^2$

$x^2=100$

$x=10$

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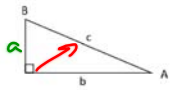
Opposite/Adjacent/Hypotenuse

To understand sine, cosine, and tangent, you must be able to find nd label sides as adjacent or opposite of an angle.



What **side** is the hypotenuse? c

What **side** is opposite of $\angle A$? a

What **side** is adjacent to $\angle A$? b

What **side** is opposite of $\angle B$? b

What **side** is adjacent to $\angle B$? a

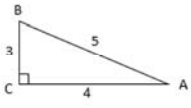
Sine (sin) / Cosine (cos) / Tangent (tan)

To remember the trigonometric ratio we can use the following saying:

SOH-CAH-TOA

Sin = $\frac{\text{opposite}}{\text{hypotenuse}}$ Cos = $\frac{\text{adjacent}}{\text{hypotenuse}}$ Tan = $\frac{\text{opposite}}{\text{adjacent}}$

Using the triangle below express sine-cosine-tangent.



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

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

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

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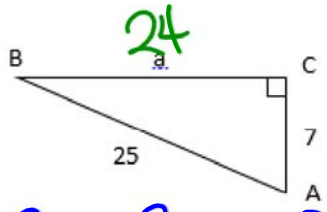
Examples: Use the triangle below to find sin, cos, tan. NO DECIMALS!

1. sin A = $\frac{24}{25}$
2. cos A = $\frac{7}{25}$
3. tan A = $\frac{24}{7}$
4. sin B = $\frac{7}{25}$
5. cos B = $\frac{24}{25}$
6. tan B = $\frac{7}{24}$



$a^2 + 7^2 = 25^2$

$a^2 = 576$

$a = 24$

Finding Missing Sides

You can find trigonometric ratios using your calculator!

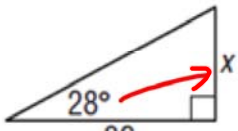
****** Make sure your calculator is in** degree mode ********

Examples: Find the values using your calculator

7. sin 45° .7071
8. cos 87° .0523
9. tan 37° .7536

Examples: Find the missing side lengths.

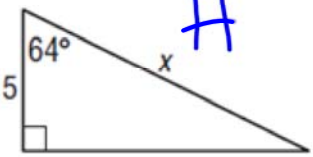
10.



O

A

11.



A

H

$\tan 28° = \frac{x}{32} \cdot 32$

$32 \cdot \tan 28 = x$

$17.0 = x$

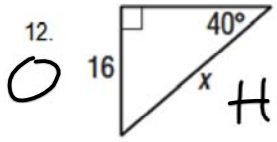
$\cos 64 = \frac{15}{x} \cdot x$

$x \cdot \cos(64) = 15$

$x = \frac{15}{\cos(64)}$

$x = 34.2$

12.



O

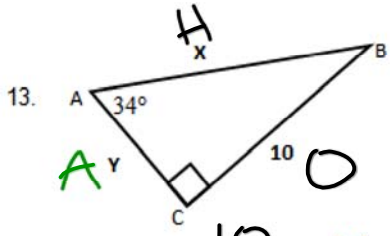
H

$\sin 40° = \frac{16}{x} \cdot x$

$x = \frac{16}{\sin 40}$

$x = 24.9$

13.



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$\sin 34 = \frac{10}{x} \cdot x$

$x = \frac{10}{\sin 34}$

$x = 17.9$

$\tan 34 = \frac{10}{y} \cdot y$

$y = \frac{10}{\tan 34}$

$y = 14.8$

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odds

1,3,5 & 1,3,5,7