Monday, April 20, 2020

Begin Review of Chapter 7 Material

Special Right Triangles:

The two Δ's referred to as Special Right Triangles are:

- 45^o- 45^o- 90^o Δ

  AND

- 30^o- 60^o- 90^o Δ

45^o- 45^o- 90^o Δ
This is also known as an Isosceles Right Δ

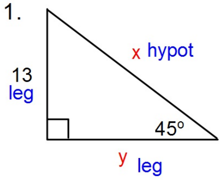
Relationships to know:

1. The legs are equal
2. hypotenuse = Leg $\cdot \sqrt{2}$
3. Leg = hypotenuse $\div \sqrt{2}$

Example Problems using the relationships in a 45^o- 45^o- 90^o Δ

Find the EXACT value of x and y in each triangle.

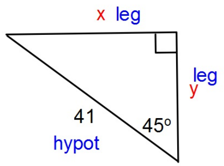
1.



legs are ≅: y = 13

hypot: $x = \text{leg} \cdot \sqrt{2} = 13\sqrt{2}$

2.



legs are ≅, therefore, x = y

Leg = hypotenuse ÷ $\sqrt{2}$

$= \frac{41}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{41\sqrt{2}}{2}$

$x = y = \frac{41\sqrt{2}}{2}$

30°- 60°- 90° Δ

Vocabulary:

Short Leg (SL): the leg opposite the 30° angle.

Long Leg (LL): the leg opposite the 60° angle.

30°- 60°- 90° Δ

Relationships to know:

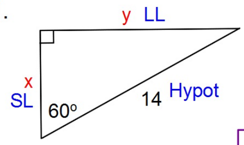
1. $SL = \frac{hypot}{2}$ → $hypot = 2 \cdot SL$

2. $LL = SL \cdot \sqrt{3}$ → $SL = \frac{LL}{\sqrt{3}}$

Example Problems using the relationships in a 30°- 60°- 90° Δ

Find the EXACT value of x and y in each triangle.

1.



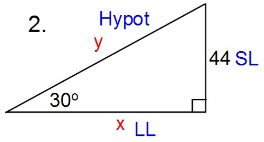
For x:

x = SL: x = hyp÷2 = 14÷2 = 7

For y:

y = LL: y = SL · $\sqrt{3}$ = 7 · $\sqrt{3}$ = $7\sqrt{3}$

2.



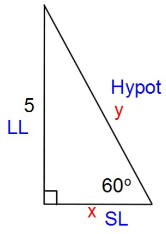
For x:

x = LL: x = SL $\cdot \sqrt{3}$ = $\boxed{44\sqrt{3}}$

For y:

y = hypot: $y = 2 \cdot$ SL $= 2 \cdot 44 = \boxed{88}$

3.



For x:

x = SL: $x = \frac{\text{LL}}{\sqrt{3}}$

$= \frac{5}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{5\sqrt{3}}{3}}$

For y:

y = hypot: $y = 2 \cdot$ SL

$= 2 \cdot \frac{5\sqrt{3}}{3} = \boxed{\frac{10\sqrt{3}}{3}}$

S

Trigonometric Ratios:

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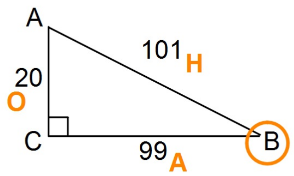
SinA = $\frac{\text{opp leg}}{\text{hypot}}$

CosA = $\frac{\text{adj leg}}{\text{hypot}}$

TanA = $\frac{\text{opp leg}}{\text{adj leg}}$

Use ΔABC to write each as a ratio:



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1. CosB = $\frac{99}{101}$

2. TanB = $\frac{20}{99}$

3. SinB = $\frac{20}{101}$

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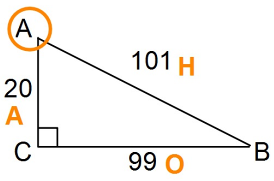

1. CosA = $\frac{20}{101}$
2. TanA = $\frac{99}{20}$
3. SinA = $\frac{99}{101}$

Use ΔEFG to write each as a ratio:

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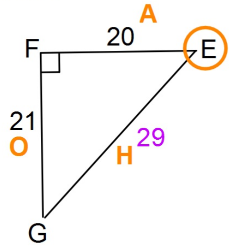

1. TanE = $\frac{21}{20}$
2. SinE = $\frac{21}{29}$

First find the missing hypotenuse:
Use Pythagorean Theorem

$\text{hypot}^2 = 20^2 + 21^2$

$\text{hypot} = \sqrt{20^2 + 21^2} = 29$

In rt ΔABC ∠C is the right angle.

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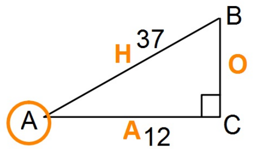
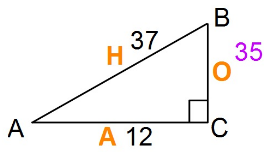
Given CosA = $\frac{12}{37}$, find the SinA and TanA.

First, draw and label ΔABC

CosA = $\frac{12}{37}$ ⟵ adj leg ⟵ hypot





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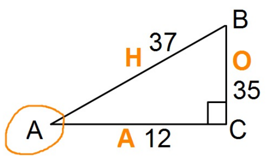
Second find the missing Leg:

Use Pythagorean Theorem

$37^2 = 12^2 + \text{leg}^2$

$\text{leg} = \sqrt{37^2 - 12^2} = 35$



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Now you can find SinA and TanA

$$\text{SinA} = \frac{35}{37}$$

$$\text{TanA} = \frac{35}{12}$$

You can now finish Practice #18 which is on my blog.