

Name: _____
 Period: _____

Warm-up: before Section 17.1

SHOW YOUR WORK as demonstrated in class notes

1. Simplify.

$$2\sqrt{18}$$

$$= 2\sqrt{3 \cdot 3 \cdot 2}$$

$$= 6\sqrt{2}$$

2. Simplify.

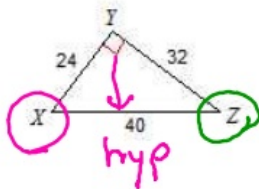
$$\sqrt{5} \cdot \sqrt{5}$$

$$= 5$$

3. Rationalize the denominator

$$\frac{1}{\sqrt{2}} \left(\frac{\sqrt{2}}{\sqrt{2}} \right) = \frac{\sqrt{2}}{2}$$

4. Determine the ratios for each of the trigonometric functions



$$\frac{p}{h} \sin X = \frac{32}{40} = \frac{4}{5}$$

$$\cos X = \frac{24}{40} = \frac{3}{5}$$

$$\tan X = \frac{32}{24} = \frac{4}{3}$$

$$\sin Z = \frac{24}{40} = \frac{3}{5}$$

$$\cos Z = \frac{32}{40} = \frac{4}{5}$$

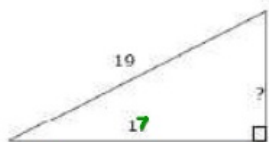
$$\tan Z = \frac{24}{32} = \frac{3}{4}$$

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

$$\text{leg}^2 + \text{leg}^2 = \text{hyp}^2$$

Using Pythagorean's Theorem determine the length of the missing side.

6.



$$17^2 + x^2 = 19^2$$

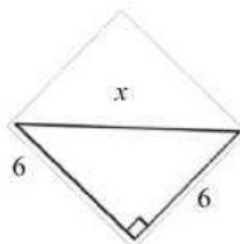
$$x^2 = 361 - 289$$

$$\sqrt{x^2} = \sqrt{72}$$

$$x = \sqrt{6 \cdot 6 \cdot 2}$$

$$x = 6\sqrt{2}$$

7.

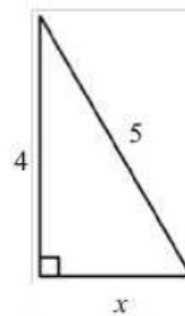


$$6^2 + 6^2 = x^2$$

$$\sqrt{72} = \sqrt{x^2}$$

$$6\sqrt{2} = x$$

8.



$$4^2 + x^2 = 5^2$$

$$16 + x^2 = 25$$

$$\sqrt{x^2} = \sqrt{9}$$

$$x = 3$$

Please wait to turn over your paper. Thank you!

Homework

(22)

$$\frac{2}{5\sqrt{5}} \left(\frac{\sqrt{5}}{\sqrt{5}} \right) \\ = \frac{2\sqrt{5}}{25}$$

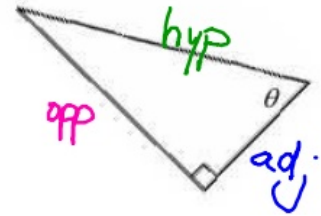
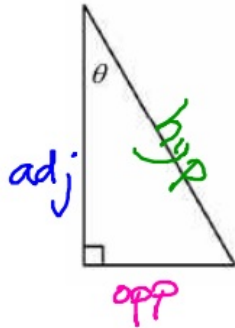
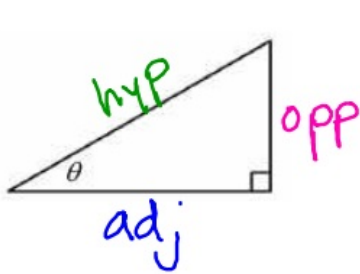
(20)

$$\frac{\sqrt{8}}{\sqrt{6}} \left(\frac{\sqrt{6}}{\sqrt{6}} \right) \\ = \frac{\sqrt{8 \cdot 6}}{6} \\ = \frac{\sqrt{2 \cdot 2 \cdot 2 \cdot 3}}{6} \\ = \frac{4\sqrt{3}}{6} \\ = \frac{2\sqrt{3}}{3}$$

(18)

$$\frac{\sqrt{4}}{4\sqrt{5}} \left(\frac{\sqrt{5}}{\sqrt{5}} \right) \\ = \frac{2\sqrt{5}}{20} \\ = \frac{\sqrt{5}}{10}$$

Identify the side *opposite* to θ (theta), the side *adjacent* to θ , and the *hypotenuse* of each triangle.



Write the trigonometric ratios

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

Find $\sin \theta$, $\cos \theta$, $\tan \theta$ for the given triangle.
and find $\sin \alpha$, $\cos \alpha$, $\tan \alpha$ for the given triangle.

(note: This is the triangle from the warm-up)

~~$\sin \theta = \text{_____}$~~

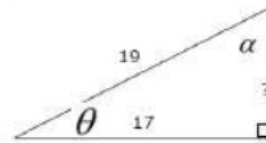
~~$\sin \alpha = \text{_____}$~~

~~$\cos \theta = \text{_____}$~~

~~$\cos \alpha = \text{_____}$~~

~~$\tan \theta = \text{_____}$~~

~~$\tan \alpha = \text{_____}$~~

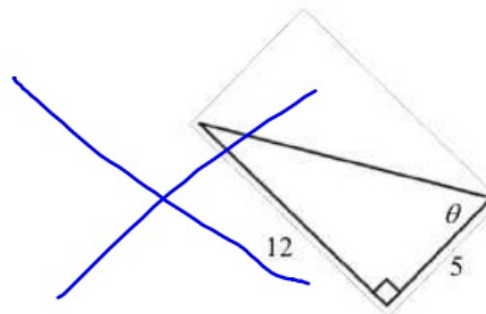


Find $\sin \theta$, $\cos \theta$, $\tan \theta$ for the given triangle.

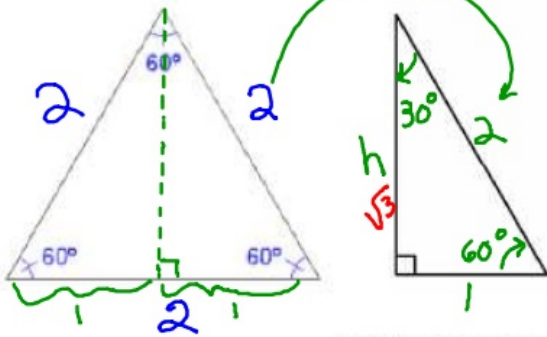
~~$\sin \theta = \text{_____}$~~

~~$\cos \theta = \text{_____}$~~

~~$\tan \theta = \text{_____}$~~



Building *** Special Triangle ***



$$1^2 + h^2 = 2^2$$

$$h^2 = 4 - 1$$

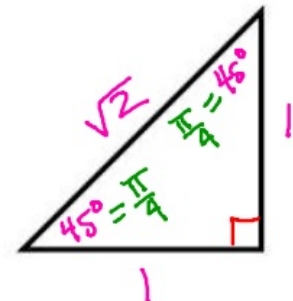
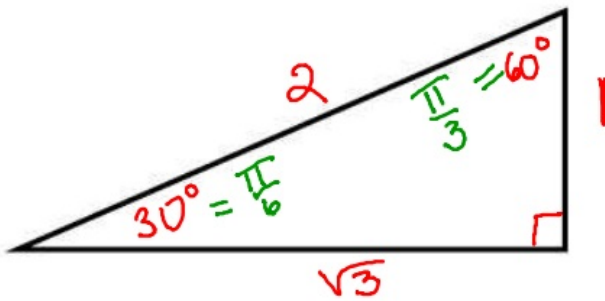
$$\sqrt{h^2} = \sqrt{3}$$

$$h = \sqrt{3}$$

*** Special Triangles *** **YOU MUST MEMORIZE THESE !!!**

30 - 60 - 90

45 - 45 - 90



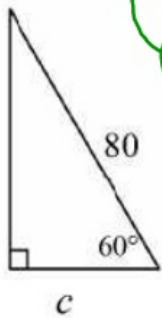
Find the value of

$$\frac{a}{h} \cos 60^\circ = \frac{1}{2}$$

$$\tan 30^\circ = \frac{1}{\sqrt{3}} \left(\frac{\sqrt{3}}{\sqrt{3}} \right) = \frac{\sqrt{3}}{3}$$

$$\sin 45^\circ = \frac{1}{\sqrt{2}} \left(\frac{\sqrt{2}}{\sqrt{2}} \right) = \frac{\sqrt{2}}{2}$$

Find the length of the missing side c .



$$\cos 60^\circ = \frac{c}{80}$$

$$\left(\frac{80}{80} \right) \frac{1}{2} = \frac{c}{80} \left(\frac{80}{80} \right)$$

$$40 = c$$

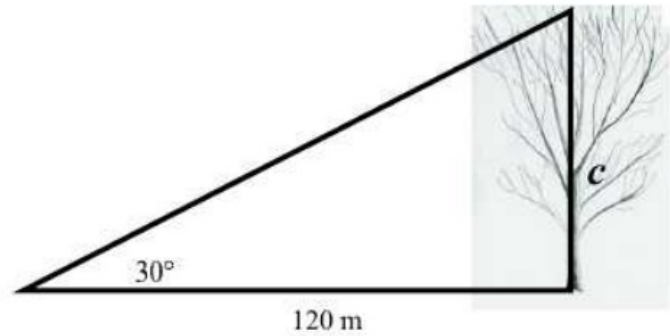
$$\tan 30^\circ = \frac{c}{120}$$

$$(120) \frac{1}{\sqrt{3}} = \frac{c}{120}$$

$$\left(\frac{\sqrt{3}}{\sqrt{3}}\right) \frac{120}{\sqrt{3}} = c$$

$$\frac{120\sqrt{3}}{3} = c$$

$$40\sqrt{3} = c$$



Reciprocal functions

$$\csc \theta = \frac{\text{hyp}}{\text{opp}} \quad (\text{cosecant})$$

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\sec \theta = \frac{\text{hyp}}{\text{adj}} \quad (\text{secant})$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\cot \theta = \frac{\text{adj}}{\text{opp}} \quad (\text{cotangent})$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

If $\cos \theta = \frac{8}{17}$, find the other five trigonometric ratios for θ

$$\sin \theta = \frac{15}{17}$$

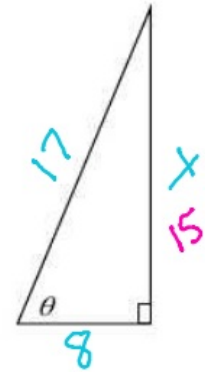
$$\csc \theta = \frac{17}{15}$$

$$\cos \theta = \frac{8}{17}$$

$$\sec \theta = \frac{17}{8}$$

$$\tan \theta = \frac{15}{8}$$

$$\cot \theta = \frac{8}{15}$$



$$\begin{aligned} 8^2 + X^2 &= 17^2 \\ X^2 &= 17^2 - 8^2 \\ \sqrt{X^2} &= \sqrt{225} \\ X &= 15 \end{aligned}$$