Lesson 3 Homework – Finding Angles in Right Triangles

1. Fill in the sides in the following ratios

$\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$ $\tan A = \frac{\text{opposite}}{\text{adjacent}}$ $\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$

Find the **measure of angle** $\angle A$, each of the given right triangles, to the *nearest degree*. Show all work.

2. m∠M = 45°

4. m∠M = 40°

3. m∠M = 60°

5. m∠M = 30°

6. Use your calculator to determine the measure of $\angle A$ to the *nearest tenth*.

a. sin A = 0.1908 11.0

b. cos A = 0.3356 70.4

c. cos A = 0.9397 20.0

d. tan A = 1.4142 54.7

e. sin A = .5800 35.5

f. tan A = 1.7321 60.0

$\cos Z = \frac{5}{7}$ $m\angle Z = 44.4°$ $\cos^{-1}\left(\frac{5}{7}\right) = 44.4°$

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$\sin A = \frac{opp}{hyp}$ $\cos A = \frac{adj}{hyp}$ $\tan A = \frac{opp}{adj}$

missing side

$\sin 30 = \frac{x}{2}$

$\sin X = \frac{1}{2}$

missing ∠

$\sin^{-1}$ $\cos^{-1}$ $\tan^{-1}$

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7. If the hypotenuse and a leg of a triangle measure 13 and 8, respectively, what is the value of the angle between them to the nearest tenth of a degree?

The angle is 52.0°

$\cos X = \frac{8}{13}$

13 H, 8 A

8. In a triangle, the lengths of the two legs are 4 and 5. What is the measure of the angle between the hypotenuse and the longer leg, to the nearest degree?

The angle is 39°

Draw a picture!

9. In the diagram below, $\angle B$ and $\angle D$ are right angles. Find $m\angle ACD$, to the nearest hundredth of a degree.

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

$6^2 + 2.5^2 = AC^2$

$6.5 = AC$

$m\angle ACD = 50.28°$

$\sin X = \frac{5}{6.5}$

Lesson 4: Finding Sides of a Right Triangle (BE SURE THAT YOUR CALCULATOR IS IN DEGREES)

Warm-up: Solve for x in each equation.

$5 = \frac{x}{27}$ $6 = \frac{30}{x}$ $\frac{12}{8} = \frac{3}{x+2}$

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10, 15, x

x, 12, 40

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Example 1:
Use a calculator to calculate the ratio of the sides of a triangle with the given angles. Please round to the nearest thousandth.

sin 18° = .309 sin 1° = 0.017 cos 35° = .819

cos 40° = .766 tan 80° = 5.671 tan 21° = 0.384

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Example 2:
Calculate the unknown side in each of the following, to the nearest tenth:

a) sin 20 = a/15 b) cos 37 = 30/d

VS

$\sin 20 = \frac{a}{15}$

$15 \cdot \sin 20 = a$

$5.1 = a$

$\cos 37 = \frac{30}{d}$

$d \cdot \cos 37 = 30$

$\frac{d \cdot \cos 37}{\cos 37} = \frac{30}{\cos 37}$

$d = 37.6$

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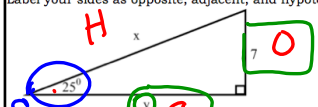
Example 3:
Label your sides as opposite, adjacent, and hypotenuse.



Which trigonometric ratio could be used to find side x?

Side y?

$\sin 25 = \frac{7}{x}$

$x \cdot \sin 25 = 7$

$\frac{x \cdot \sin 25}{\sin 25} = \frac{7}{\sin 25}$

$x = 16.6$

$\tan 25 = \frac{7}{y}$

$y \cdot \tan 25 = 7$

$\frac{y \cdot \tan 25}{\tan 25} = \frac{7}{\tan 25}$

$y = 15.0$

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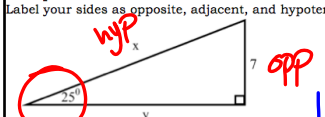
Example 3:
Label your sides as opposite, adjacent, and hypotenuse.



Which trigonometric ratio could be used to find side x?

Side y?

$\sin 25 = \frac{7}{x}$

$\tan 25 = \frac{7}{y}$

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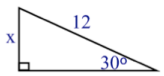
Steps to finding Sides:

1. Label your sides as opposite, adjacent, and hypotenuse (according to the given angle).
2. Choose the correct ratio (using the given side and the desired side): sin, cos, or tan
3. Set up ratio and solve



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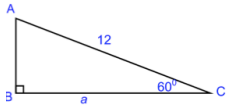
Example 4: Calculate the length of side *a* to the nearest integer.



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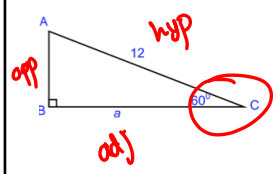
Example 4: Calculate the length of side a to the nearest integer.



$\frac{\cos 60}{1} = \frac{a}{12}$

$a = 12(\cos 60)$

$a = 6$

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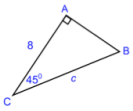
Example 5: Calculate the length of side c to the nearest hundredth.



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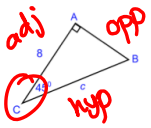
Example 5: Calculate the length of side c to the nearest hundredth.



$\frac{\cos 45}{1} = \frac{8}{c}$

$c(\cos 45) = 8$

$c = \frac{8}{\cos 45}$

8/cos(45
11.3137085

$c = 11.31$

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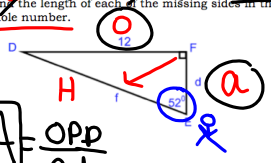
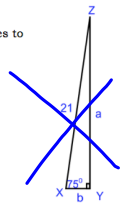
Example 6: Find the length of each of the missing sides in the given triangles to the nearest whole number.





$\text{Tan}\,A = \frac{\text{opp}}{\text{adj}}$

$\frac{\text{Tan}\,52}{1} = \frac{12}{d}$

$d \cdot \text{Tan}\,52 = 12$

$\frac{d \cdot \text{Tan}\,52}{\text{Tan}\,52} = \frac{12}{\text{Tan}\,52}$

$d = 9$

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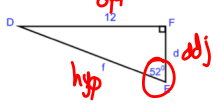
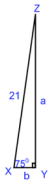
Example 6: Find the length of each of the missing sides in the given triangles to the nearest whole number.





$\frac{\tan 52}{1} = \frac{12}{d}$

$12 = d(\tan 52)$

$d = \frac{12}{(\tan 52)}$

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Example 7: In right triangle ABC, hypotenuse AB = 15 and angle A = 35°. Find the length of BC to the nearest tenth.

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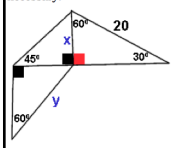
Example 8: Find the values of both x and y. Round your answer to the nearest tenth, if necessary.



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HW 8-4

HW Packet 8-4

#8 requires multiple steps!

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