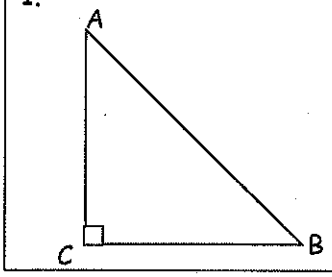
Geometry Notes Day 1

Name Key

7.5-7.6 Trig Ratios (SOH CAH TOA)

1.



a. What leg is opposite ∠B? AC

b. What side is the hypotenuse? AB

c. What leg is adjacent to ∠B ? (remember a leg can't be the hypotenuse) BC

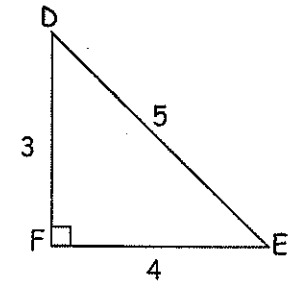
Based on the pictures in #3 and #4, answer each of the following.

2. a. Are the triangles in #3 and #4 similar? yes ... by SSS~

$\frac{3}{9} = \frac{4}{12} = \frac{5}{15}$ Scale factor 1:3

b. Because similar triangles have corresponding angles that are Congruent, we know that: $\angle D \cong \angle G$, $\angle F \cong \angle L$, and $\angle E \cong \angle H$

3.



From ∠D...

a. What is the length of the opposite leg? 4

b. What is the length of the hypotenuse? 5

c. What is the length of the adjacent leg? 3

From ∠D...

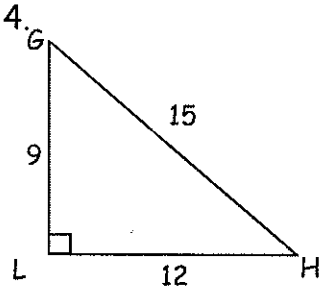
(give answers in fractions and as rounded decimals)

d. What is the ratio of the opposite leg to the hypotenuse? $\frac{4}{5} = .8$

e. What is the ratio of the adjacent leg to the hypotenuse? $\frac{3}{5} = .6$

f. What is the ratio of the opposite leg to the adjacent leg? $\frac{4}{3} = 1.\overline{3}$

4.



From ∠G...

a. What is the length of the opposite leg? 12

b. What is the length of the hypotenuse? 15

c. What is the length of the adjacent leg? 9

From ∠G... (give answers in fractions and decimals)

d. What is the ratio of the opposite leg to the hypotenuse? $\frac{12}{15} = \frac{4}{5} = .8$

e. What is the ratio of the adjacent leg to the hypotenuse? $\frac{9}{15} = \frac{3}{5} = .6$

f. What is the ratio of the opposite leg to the adjacent leg? $\frac{12}{9} = \frac{4}{3} = 1.\overline{3}$

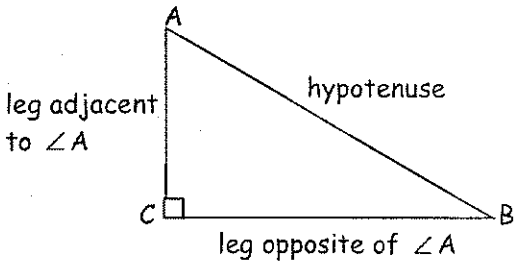
Each of the ratios from #3 are equal to each of the ratios from #4.

Explain why you think this is true: Because the Δs are Similar

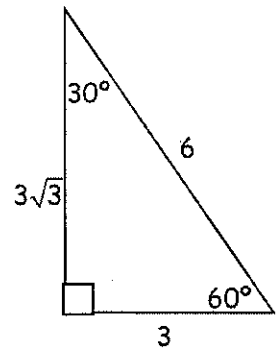
Trigonometry is the study of angles and side lengths in a triangle. A **trigonometric ratio** is a ratio of the lengths of two sides of a **right triangle**. These ratios are given specific names.

Trig Ratios: A way to remember the ratios is to use the acronym: **SOH CAH TOA**

Name	Abbreviation	Ratio of sides...
Sine	sin	$\sin(A) = \frac{\text{length of leg opposite } \angle A}{\text{length of hypotenuse}}$
Cosine	cos	$\cos(A) = \frac{\text{length of leg adjacent to } \angle A}{\text{length of hypotenuse}}$
Tangent	tan	$\tan(A) = \frac{\text{length of leg opposite of } \angle A}{\text{length of leg adjacent to } \angle A}$



Complete each ratio using the picture below.



1. $\sin(30) = \frac{3}{6}$ = $\frac{1}{2}$
2. $\tan(30) = \frac{3}{3\sqrt{3}}$ = $\frac{\sqrt{3}}{3}$
3. $\cos(60) = \frac{3}{6}$ = $\frac{1}{2}$
4. $\tan(30^\circ) = \frac{3}{3\sqrt{3}}$
5. $\cos(60^\circ) = \frac{3}{6}$
6. $\cos(60) = \frac{3}{6}$
7. $\tan(60) = \frac{3\sqrt{3}}{3}$
8. $\cos(60^\circ) = \frac{1}{2}$ think simplified fraction!
9. $\tan(30^\circ) = \frac{\sqrt{3}}{3}$ think simplified fraction!
10. $\cos(30^\circ) = \frac{\sqrt{3}}{2}$ think simplified fraction!

Find the indicated trig.ratio of sides as a fraction and as a decimal (rounded to the nearest 100th).

11. Sin ∠B = $\frac{8}{16}$
Sin ∠B = $\frac{1}{2}$
Sin ∠B = .5

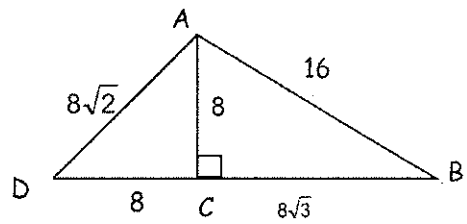
12. Cos ∠D = $\frac{8}{8\sqrt{2}}$
Cos ∠D = $\frac{\sqrt{2}}{2}$
Cos ∠D = .71

13. Tan ∠D = $\frac{8}{8}$
tan ∠D = 1

14. Sin ∠DAC = $\frac{8}{8\sqrt{2}}$
Sin ∠DAC = $\frac{\sqrt{2}}{2}$
Sin ∠DAC = .71

15. Tan ∠B = $\frac{8}{8\sqrt{3}}$
tan ∠B = $\frac{\sqrt{3}}{3}$
tan ∠B = .58

16. Cos ∠BAC = $\frac{8}{16}$
Cos ∠BAC = $\frac{1}{2}$
Cos ∠BAC = .5



Trig functions on your Scientific Calculator. Your calculator has the ratios stored!!

Determine the value of each ratio, using your calculator. Round to the nearest hundredth:

17. Sin (60°)	18. Tan (45°)	19. Cos (30°)	20. Tan (52°)	21. Sin (64°)
.87	1	.87	1.28	.90