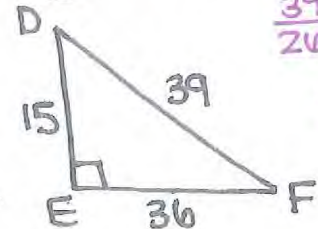
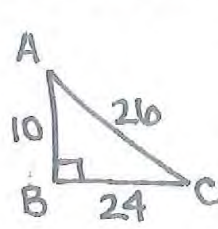


Trig Ratios + Similar Triangles

Are the triangles similar? Yes, b/c of SSS similarity + SAS similarity



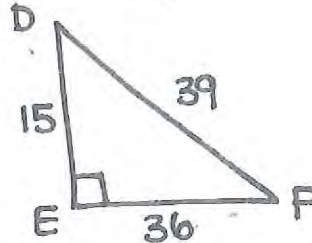
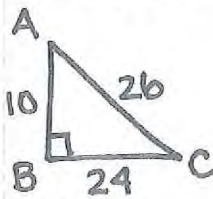
$$\frac{39}{26} = 1.5$$

$$\frac{36}{24} = 1.5$$

$$\frac{15}{10} = 1.5$$

If two triangles are similar, then their corresponding angles are congruent.

$$\triangle ABC \sim \triangle DEF$$



Find the trig ratios listed. Round to the nearest ten-thousandth.

$$\sin A = \frac{24}{26} = 0.9231$$

$$\cos A = \frac{10}{26} = 0.3846$$

$$\tan A = \frac{24}{10} = 2.4$$

$$\sin C = \frac{10}{26} = 0.3846$$

$$\cos C = \frac{24}{26} = 0.9231$$

$$\tan C = \frac{10}{24} = 0.4167$$

$$\sin D = \frac{36}{39} = 0.9231$$

$$\cos D = \frac{15}{39} = 0.3846$$

$$\tan D = \frac{36}{15} = 2.4$$

$$\sin F = \frac{15}{39} = 0.3846$$

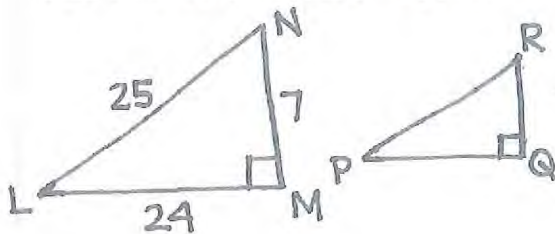
$$\cos F = \frac{36}{39} = 0.9231$$

$$\tan F = \frac{15}{36} = 0.4167$$

In similar triangles, because the measures of corresponding angles are congruent and corresponding sides are proportional, the trig ratios for the corresponding angles are equal.

Example 1:

$$\triangle LMN \sim \triangle PQR$$



Round to the nearest ten-thousandth.

$$\sin P = \sin L = \frac{7}{25} = 0.28$$

$$\tan R = \tan N = \frac{24}{7} = 3.4286$$

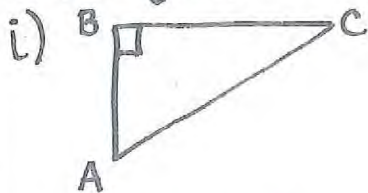
$$\cos P = \cos L = \frac{24}{25} = 0.96$$

* Trig Ratios & Complementary Angles *

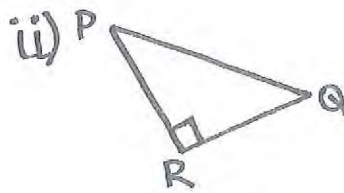
What are complementary angles?

two angles that add up to 90°

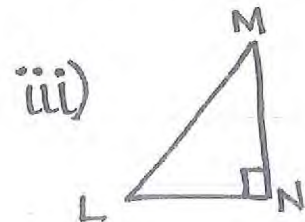
Name the complementary angles in each triangle.



$\angle A + \angle C$



$\angle P + \angle Q$

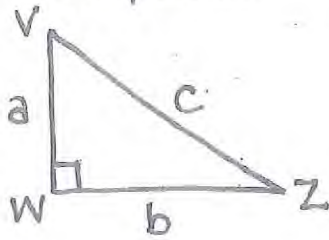


$\angle L + \angle M$

Does every right triangle have a pair of complementary angles? Explain.

Yes, because all 3 angles in a triangle add to 180° . In a right triangle, one of the angles is 90° . Therefore, the sum of the other two angles must be 90° . The acute angles in every right triangle are complementary.

Example 2:



i) Identify the complementary angles. $\angle V + \angle Z$

ii) Find the following trig ratios...

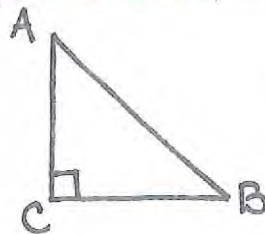
$$\sin V = \frac{b}{c}$$

$$\cos Z = \frac{b}{c}$$

$$\sin Z = \frac{a}{c}$$

$$\cos V = \frac{a}{c}$$

In a right triangle, the sine of one acute angle is equal to the cosine of its complement and vice versa.



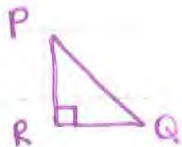
$$\sin A = \cos B$$

$$\cos A = \sin B$$

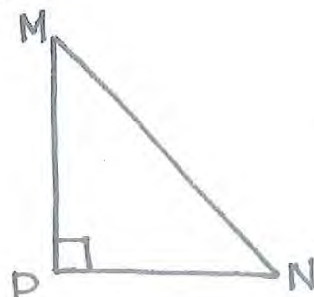
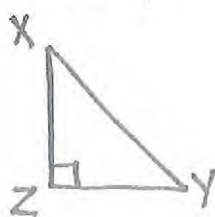
Example 3:

$\angle P$ and $\angle Q$ are complementary angles in right triangle PQR. $\cos Q = 0.9867$

What is the $\sin P$? 0.9867 b/c $\cos Q = \sin P$



Example 4:



$\triangle XYZ \sim \triangle MNP$
 $\sin X$ is congruent to
 what other trig ratios?

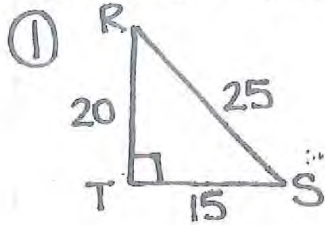
$$\sin X = \sin M$$

$$\sin X = \cos Y$$

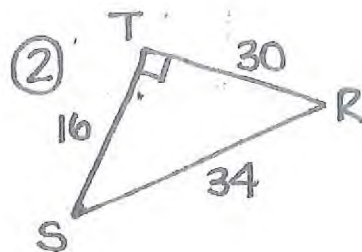
$$\sin X = \cos N$$

Trig Ratios Practice #1

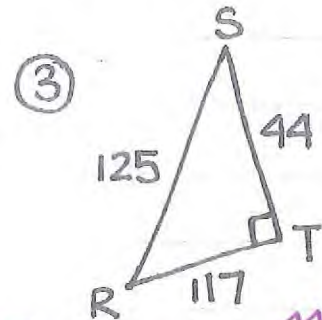
Find the trig ratios. Round to the nearest thousandth.



$$\begin{aligned}\tan S &= \frac{20}{15} = 1.333 \\ \sin R &= \frac{15}{25} = 0.6 \\ \cos R &= \frac{20}{25} = 0.8\end{aligned}$$

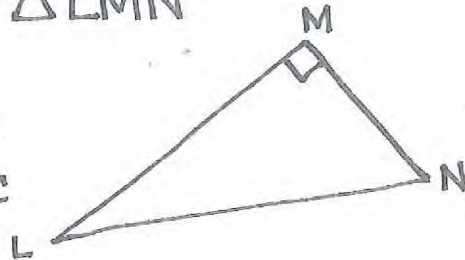
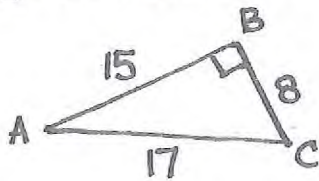


$$\begin{aligned}\sin S &= \frac{30}{34} = 0.882 \\ \tan S &= \frac{30}{16} = 1.875 \\ \cos R &= \frac{30}{34} = 0.882\end{aligned}$$



$$\begin{aligned}\tan R &= \frac{44}{117} = 0.376 \\ \cos S &= \frac{44}{125} = 0.352 \\ \sin S &= \frac{117}{125} = 0.936\end{aligned}$$

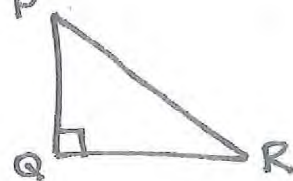
④ $\triangle ABC \sim \triangle LMN$



$$\begin{aligned}\tan L &= \frac{\tan A}{15} = 0.533 \\ \sin N &= \frac{\sin C}{17} = 0.882 \\ \cos N &= \frac{\cos C}{17} = 0.471\end{aligned}$$

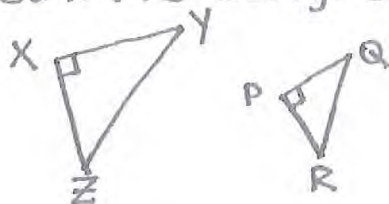
⑤ The given trig ratios are congruent to what other trig ratio?

$$\begin{aligned}\sin R &\cong \frac{\cos P}{1} \\ \cos R &\cong \frac{\sin P}{1}\end{aligned}$$



⑥ $\triangle XYZ \sim \triangle PQR$

$\sin R$ is congruent to what 3 trig ratios?



$$\begin{aligned}\sin R &\cong \frac{\cos Q}{1} \\ \sin R &\cong \frac{\cos Y}{1} \\ \sin R &\cong \frac{\sin Z}{1}\end{aligned}$$