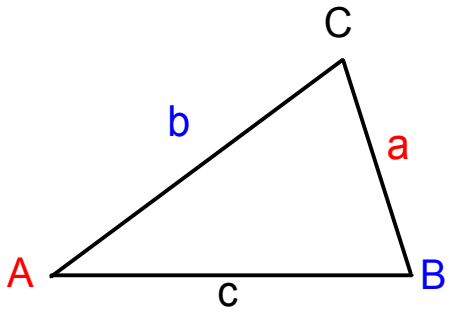
The Law of Sines:

*Used to find the missing parts of a triangle when we *DO NOT* have a right triangle.

*Useful in solving direct and indirect measurement applications

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \quad \text{or} \quad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

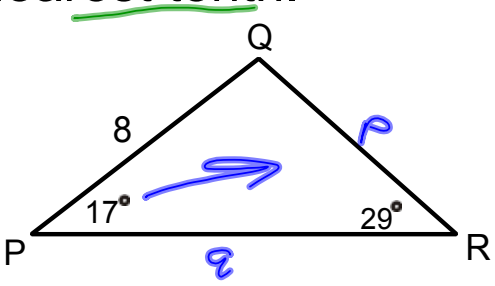


$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

7-6 The Law of Sines

Example 1:

Find p. Round to the nearest tenth.



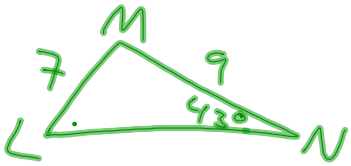
$$\frac{\sin 17^\circ}{p} = \frac{\sin 29^\circ}{8}$$

$$\frac{p \sin 29^\circ}{\sin 29^\circ} = \frac{8 \sin 17^\circ}{\sin 29^\circ}$$

$$p \approx 4.8$$

Example 2:

Find the m∠L to the nearest degree in ΔLMN if n = 7, ℓ = 9 and m∠N = 43°



$\frac{\sin 43^\circ}{7} = \frac{\sin L}{9}$

$7 \sin L = 9 \sin 43^\circ$

$\sin L = \frac{9 \sin 43^\circ}{7}$

$L = \sin^{-1}\left(\frac{9 \sin 43^\circ}{7}\right)$

$L = 61.265$

$L = 61^\circ$

Solving a triangle:

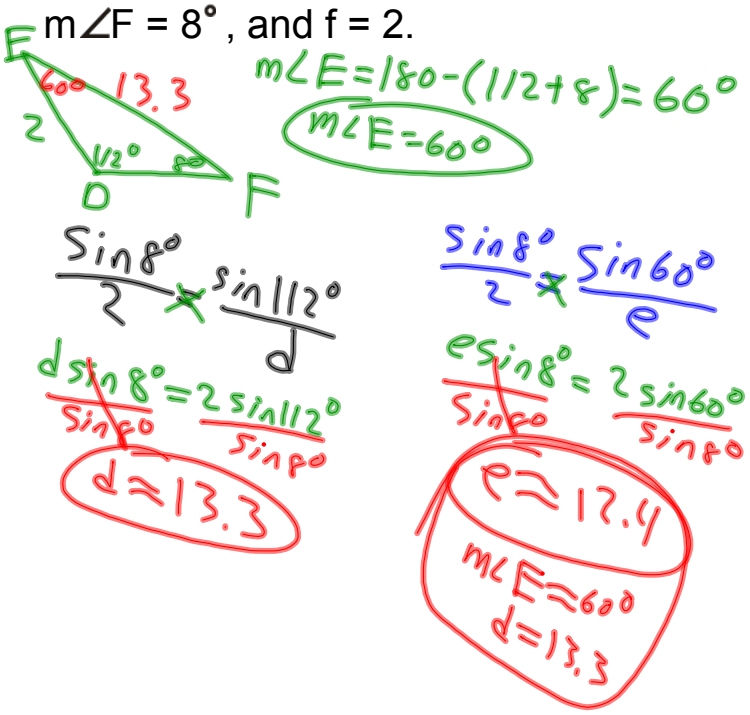
*Find the measures of all the angles and sides of a triangle.

The Law of Sines can be used to solve a triangle on the following cases:

*You know the measures of 2 angles and any side of a triangle (AAS or ASA)

*You know the measures of two sides and an angle opposite one of the sides of the triangle (SSA)

Example 3: Solve ΔDEF if $m\angle D = 112^\circ$, $m\angle F = 8^\circ$, and $f = 2$.



Example 4: Solve ΔIJL if $m\angle J = 32^\circ$, $i = 30$ and $j = 16$.