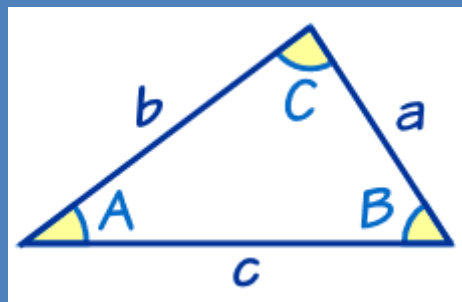


Law of Sines and Law of Cosines Guided Notes



Kennedy's Classroom Resources

The Sine Rule

EQ: How do you use the Sine Rule to find the unknown sides and angles of any triangle?

What do we need to know in order to use the Sine Rule?

OR

What is the Sine Rule?

Example 1: 2 angles and a side

Solve triangle ABC if $a = 45$ cm, $A = 97^\circ$,
and $B = 24^\circ$.

Sine Rule

Example 2: 2 angles and a side

Solve triangle ABC if $b = 11$ in, $A = 72^\circ$,
and $B = 29^\circ$.

Example 1: 2 sides and a non-included angle

Solve triangle ABC if $b = 3$ cm, $c = 1.2$ cm,
and $B = 115^\circ$.

Alternative Form of Sine Rule

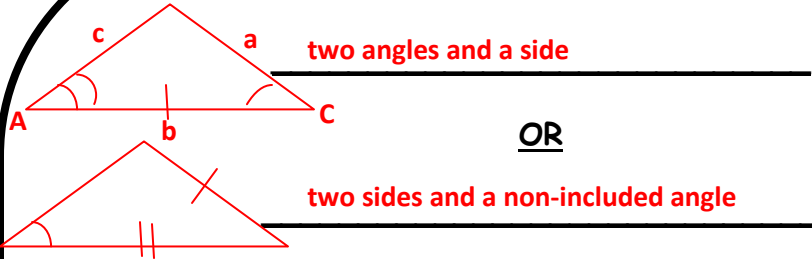
(useful when finding angles)

Example 2: 2 sides and a non-included angle

Solve triangle ABC if $b = 4$ in, $a = 6$ in, and
 $A = 72^\circ$.

EQ: How do you use the Sine Rule to find the unknown sides and angles of any triangle?

What do we need to know in order to use the Sine Rule?



What is the Sine Rule?

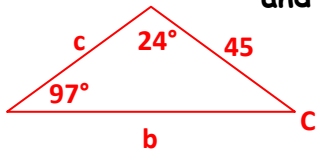
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

where a, b, c are side lengths, and
A, B, C are angles (in degrees)

Sine Rule

Example 1: 2 angles and a side

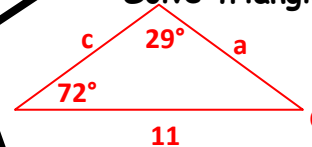
Solve triangle ABC if $a = 45$ cm, $A = 97^\circ$,
and $B = 24^\circ$.



$C = 59^\circ$
 $b = 18.44$ cm
 $c = 38.86$ cm

Example 2: 2 angles and a side

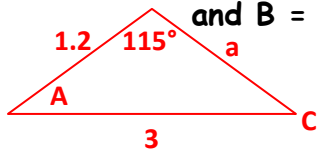
Solve triangle ABC if $b = 11$ in, $A = 72^\circ$,
and $B = 29^\circ$.



$C = 79^\circ$
 $a = 21.58$ in
 $c = 22.27$ in

Example 1: 2 sides and a non-included angle

Solve triangle ABC if $b = 3$ cm, $c = 1.2$ cm,
and $B = 115^\circ$.



$C = 21.26^\circ$
 $A = 43.74^\circ$
 $a = 2.29$ cm

Alternative Form of Sine Rule

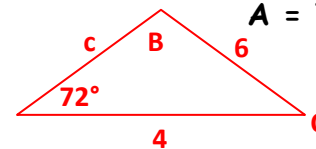
(useful when finding angles)

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

where a, b, c are side lengths, and
A, B, C are angles (in degrees)

Example 2: 2 sides and a non-included angle

Solve triangle ABC if $b = 4$ in, $a = 6$ in, and
 $A = 72^\circ$.



$B = 39.35^\circ$
 $C = 68.65^\circ$
 $c = 5.88$ in

The Cosine Rule

Name _____

EQ: How do you use the Cosine Rule to find the unknown sides and angles of any triangle?

What do we need to know in order to use the Cosine Rule?

OR

What is the Cosine Rule?

OR _____

OR _____

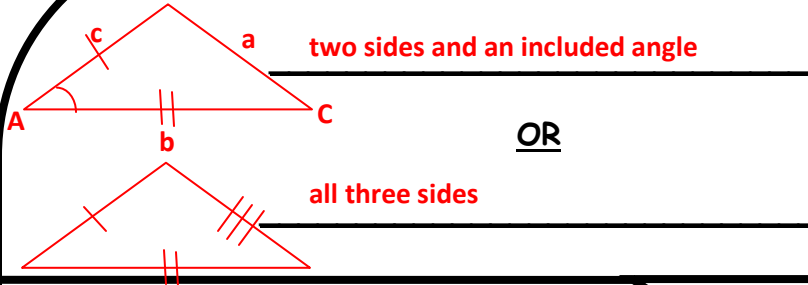
Cosine Rule

Example Find the remaining sides and angles in triangle ABC if $b = 13$ cm, $A = 42^\circ$, and $c = 11$ cm.

YOU DO: Find the remaining sides and angles in triangle PQR if $p = 4.8$ km, $q = 6.3$ km, and $R = 32^\circ$.

EQ: How do you use the Cosine Rule to find the unknown sides and angles of any triangle?

What do we need to know in order to use the Cosine Rule?



What is the Cosine Rule?

$$c^2 = a^2 + b^2 - 2ab\cos C$$

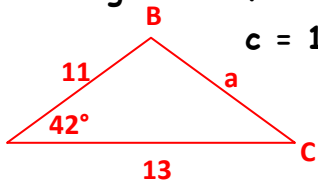
OR $a^2 = b^2 + c^2 - 2bc\cos A$

OR $b^2 = a^2 + c^2 - 2accosB$

where a, b, c are side lengths, and A, B, C are angles (in degrees)

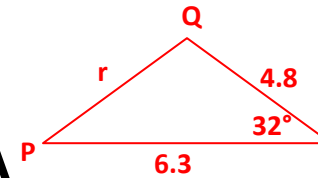
Cosine Rule

Example Find the remaining sides and angles in triangle ABC if $b = 13$ cm, $A = 42^\circ$, and $c = 11$ cm.



$a = 8.80$ cm
 $B = 81.25^\circ$
 $C = 56.75^\circ$

YOU DO: Find the remaining sides and angles in triangle PQR if $p = 4.8$ km, $q = 6.3$ km, and $R = 32^\circ$.



$r = 3.38$ km
 $P = 48.77^\circ$
 $Q = 99.23^\circ$

Encourage students to check their answers using the following rule: the largest side should be opposite the largest angle, and similarly, the smallest side should be opposite the smallest angle.