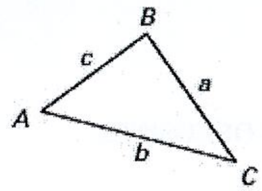
Name: Glenn ① 2-5-18 Date: ____________

13.6 The Law of Cosines GUIDED NOTES

If $\triangle ABC$ has sides of length a, b, and c as shown, then:

$$a^2 = b^2 + c^2 - 2bc \cos A$$
$$b^2 = a^2 + c^2 - 2ac \cos B$$
$$c^2 = a^2 + b^2 - 2ab \cos C$$



THE LAW OF COSINES

***A, B, C represent angles and a, b, c represent sides**

To solve a triangle when given two (2) sides and one angle:

1) Use Nsolve and the Law of Cosines to find side #3 and angle #2.
2) Use 180 – ∠1 – ∠2 to find angle #3.

$C = 180 - 62 - 75$ $\boxed{C = 43°}$

1)

$A = 62°, b = 56, c = 40$

$\boxed{a = 51.31}$

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

$a^2 = (56)^2 + (40)^2 - 2(56)(40)\cos(62°)$

$b^2 = a^2 + c^2 - 2ac \cos B$

56

$(40)^2 = (51.31)^2 + (40)^2 - 2(51.31)(40)\cos B°$ $\boxed{B = 75°}$

2)

$B = 100°, a = 12, c = 13$

$b^2 = 12^2 + 13^2 - 2(12)(13)\cos(100°)$ $\boxed{b = 19.16}$

$12^2 = 19.16^2 + 13^2 - 2(19.16)(13)\cos(A°)$ $\boxed{A = 38°}$

$C = 180 - 100 - 38$ $\boxed{C = 42°}$

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If $\triangle ABC$ has sides of length a, b, and c as shown, then:

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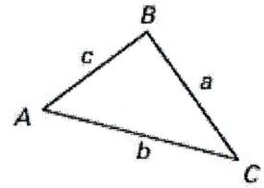
$$c^2 = a^2 + b^2 - 2ab \cos C$$



THE LAW OF COSINES

***A, B, C represent angles and a, b, c represent sides**

To solve a triangle when given <u>three (3) sides</u>:

1) Use Nsolve and the Law of Cosines to find angles #1 and #2.
2) Use $180 - \angle 1 - \angle 2$ to find angle #3.

3)
$a = 39, b = 14, c = 27$

$39^2 = 14^2 + 27^2 - 2(14)(27)\cos(A^\circ)$ $\boxed{A = 142^\circ}$

$14^2 = 39^2 + 27^2 - 2(39)(27)\cos(B^\circ)$ $\boxed{B = 13^\circ}$

$C = 180 - A - B$ $\quad C = 180 - 142 - 13$

$\boxed{C = 25^\circ}$

4)
$a = 19, b = 21, c = 13$

$19^2 = 21^2 + 13^2 - 2(21)(13)\cos(A^\circ)$ $\boxed{A = 63^\circ}$

$21^2 = 19^2 + 13^2 - 2(19)(13)\cos(B^\circ)$ $\boxed{B = 80^\circ}$

$C = 180 - A - B$ $\quad C = 180 - 63 - 80$

$\boxed{C = 37^\circ}$