**Law of Cosines**

$a^{2}=b^{2}+c^{2}-2bc\cos(A)$

$b^{2}=a^{2}+c^{2}-2ac\cos(B)$

$c^{2}=a^{2}+b^{2}-2ab\cos(C)$

**Example: (SSS)**

 $a=6, b=8, c=12$ $a=6$ $A=$

6

*C*

8

*A*

*B*

12

 $b=8$ $B=$

 $c=12$ $C=$

 to find angle *C* to find angle *A* to find angle *B*

**Example:**

 $a=4, b=10, c=52$ $a=4$ $A=$

 $b=10$ $B=$

 $c=52$ $C=$

**Example: (SAS)**

 $b=16, c=12, A=80°$ $a=$ $A=80°$

12

*B*

80°

*C*

*A*

16

 $b=16$ $B=$

 $c=12$ $C=$

 to find side *a* to find angle *C* to find angle *B*

**Application:** *In a softball game, a batter hits the ball to centerfield. The centerfielder than throws the ball to third base as shown. The distance from the centerfielder to home plate is 160 feet. The distance between the bases is 60 feet. How far did the centerfielder throw the ball?*

home

 plate

third

base

**Application:** *A ship travels 40 miles due East and then changes direction. When the ship has traveled 30 miles at this new heading, it is 56 miles from its point of departure. Describe the bearing from point B to point C.*

*A*

*B*

*C*

**Heron’s Area Formula**

 $Area= \sqrt{s\left(s-a\right)\left(s-b\right)\left(s-c\right)}$ where *s* is the semi-perimeter: $s=\frac{a+b+c}{2}$

Example: Find the area of a triangle with sides of 5 feet, 9 feet and 8 feet.