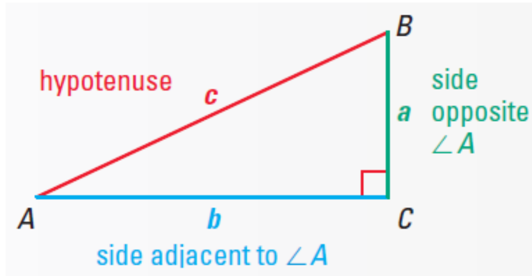
Notes Unit 7

7.1 Tangent Ratio

Tan is short for Tangent

Tangent Ratio TOA

$$Tan\ \angle A = \frac{Opposite\ \angle A}{Adjacent\ \angle A}$$

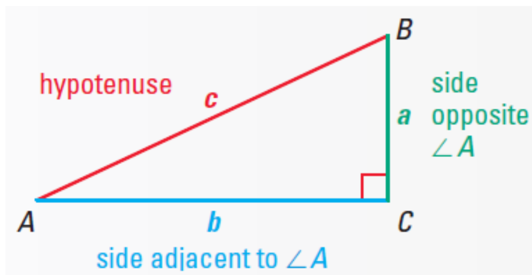


7.2 Sine and Cosine Ratio

Sin is short for Sine

Sine Ratio SOH

$$Sin\ \angle A = \frac{Opposite\ \angle A}{Hypotenuse}$$



Cos is short for Cosine

Cosine Ratio CAH

$$Cos\ \angle A = \frac{Adjacent\ \angle A}{Hypotenuse}$$

Notes 7.3 Perimeter, circumference, and area

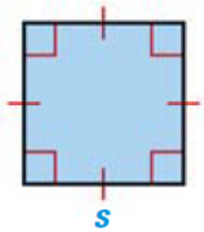
Formulas for Perimeter *P*, Area *A*, and Circumference *C*

Square

side length s

$P = 4s$

$A = s^2$

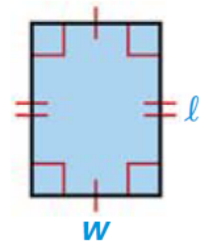


Rectangle

length ℓ and width w

$P = 2\ell + 2w$

$A = \ell w$

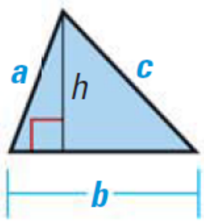


Triangle

side lengths a, b, and c, base b, and height h

$P = a + b + c$

$A = \frac{1}{2}bh$

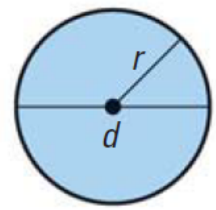


Circle

diameter d and radius r

$C = \pi d = 2\pi r$

$A = \pi r^2$

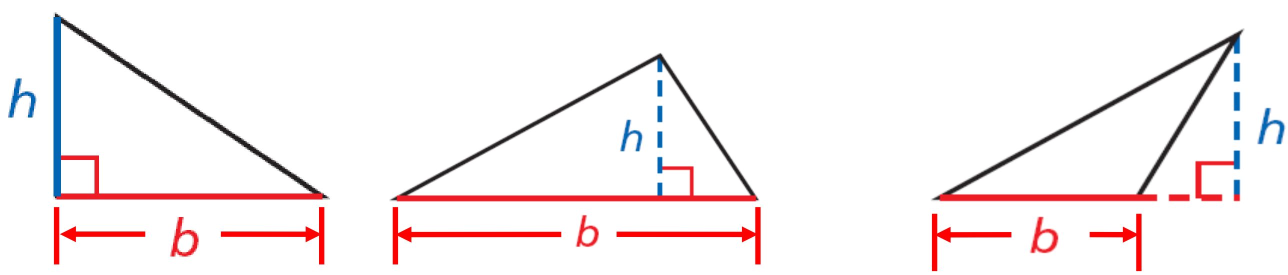


Use the π button on the calculator.

Do not use 3.14 to do calculations!

Triangles:

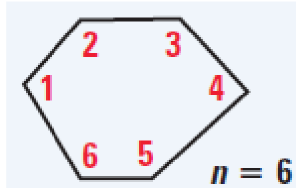
The **base** ***b*** can be any side of a triangle. The **height** ***h*** is a segment from a vertex that forms a right angle with a line containing the base. The height may be a side of the triangle or in the interior or the exterior of the triangle.



7.4 Angle Measures in Polygons

Polygon interior angle theorem

The sum of all interior angles of a polygon equals $(n-2) \cdot 180°$
where n is the number of interior angles



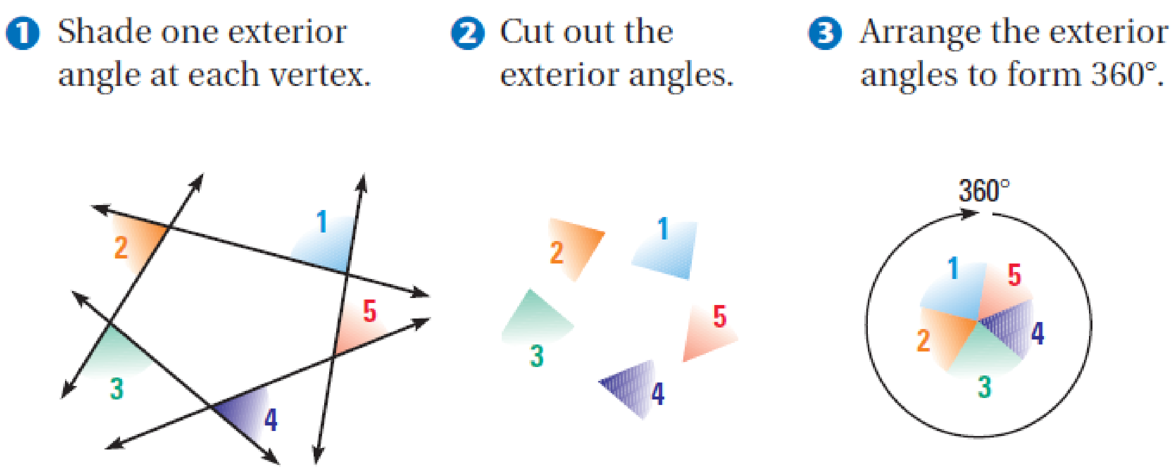
Number of sides	Polygon Name
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon
10	Decagon
11	Hendecagon
12	Dodecagon
13	13-gon
14	14-gon
n	n-gon

For finding one interior angle of a **<u>regular</u>** polygon use:

$$\frac{(n-2) \cdot 180°}{n}$$

Polygon exterior angle theorem

The sum of all exterior angles of a polygon equals 360°. This is for all polygons.



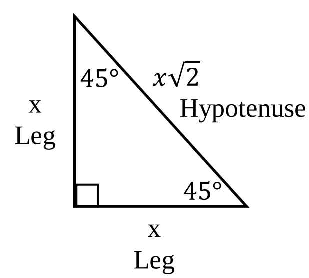
For finding one exterior angle of a polygon use:

$$\frac{360°}{n}$$

7.5 Special right triangles

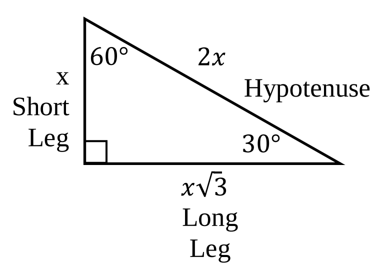
45°, 45°, 90° triangle

leg to hypotenuse: times by $\sqrt{2}$
hypotenuse to leg: divide by $\sqrt{2}$
leg to leg: times by 1



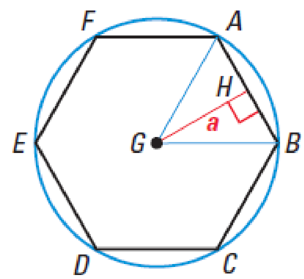
30°, 60°, 90° triangle,

short leg to hypotenuse: times by 2
hypotenuse to short leg: divide by 2
short leg to long leg: times by $\sqrt{3}$
long leg to short leg: divide by $\sqrt{3}$



7.6 Areas of Regular Polygons

Apothem of a regular polygon



The apothem is drawn from the center of the polygon perpendicular to one side of the polygon.

In the figure to the right, "a" is the apothem,
"G" is the center of the polygon,
"GA" is the radius of the polygon, and
$\angle AGB$ is the central angle.

The area of a regular "n"-gon with side lengths "s" is half the product of the apothem "a" and the perimeter "P"
So:

n = number of sides	s = length of one side	a = length of apothem
P = perimeter of polygon	A = area of polygon	central angle = angle between two consecutive radii

Formula's: $A = \frac{1}{2}aP$ or $A = \frac{1}{2} \cdot a \cdot n \cdot s$ central angle = $\frac{360°}{n}$