What's Going On?

Checking In

Minds on The theorems... so far!

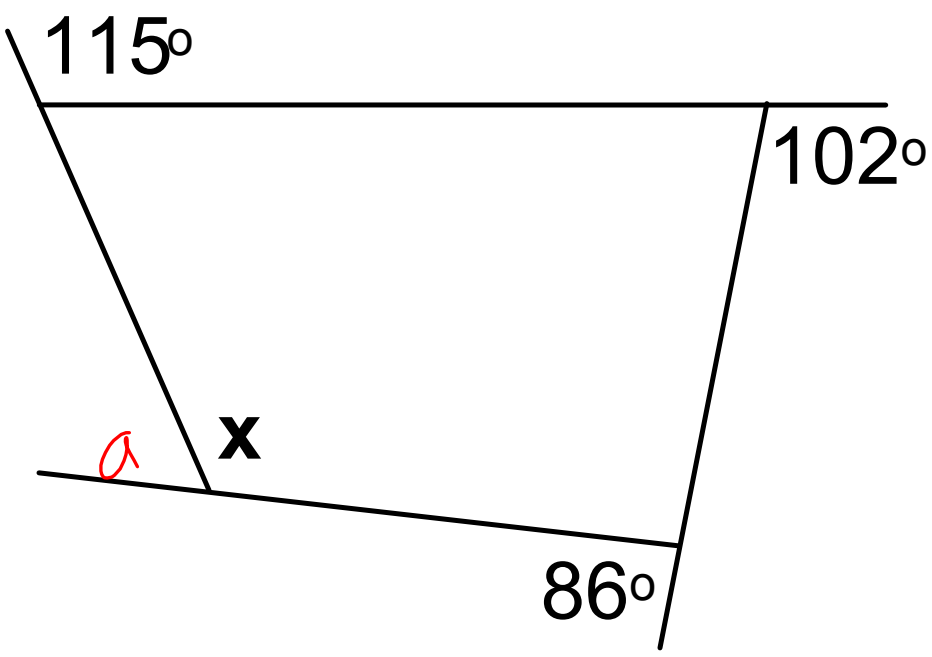
Action! iPad Investigation

Consolidation "Whiteboards"!

Learning Goal - I will explore and discover angle relationships in polygons and will be able to problem solve with them.

Checking In

Copy the diagram and determine the measure of angle x. Justify each step!



$a = 360 - 86 - 102 - 115$

$a = 57°$ by EAT

$x = 180 - 57$

$x = 123°$ by SAT

Minds on

The Theorems... So Far!

Interior Angle Theorem(s)

The sum of the interior angles of a triangle is _____

The sum of the interior angles of a quadrilateral is _____

Exterior Angle Theorem(s)

The sum of the exterior angles of a triangle is _____

The sum of the exterior angles of a quadrilateral is _____

Unit 6: Geometric Relationships

Topic #3

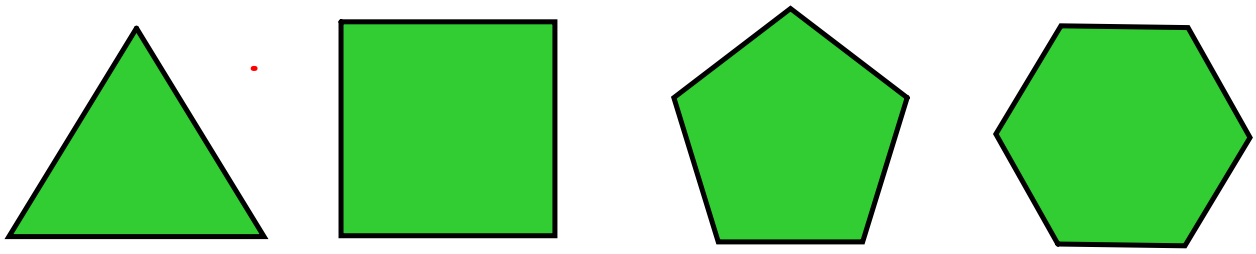
Angle Relationships in Polygons

Action!

Polygon Investigation

Regular Polygons

A regular polygon is a polygon with all equal sides and all equal angles.



Action!

Angle Investigation

Polygon	Number of Sides	Sum of Interior Angles	Sum of Exterior Angles
Triangle	3	180	360
Quadrilateral	4	360	360
Pentagon	5	540	360
Hexagon	6	720	360
Heptagon	7	900	360
Octagon	8	1080	360

Action!

Angle Relationships in Polygons

Exterior Angle Theorem

The sum of the exterior angles of ~~a triangle OR a quadrilateral~~ is 360°.

any polygon

Action!

The Interior Angle Theorem

Let's make an equation!

Number of Sides	Sum of Interior Angles
3	180
4	360
5	540
6	720
7	900
8	1080

$S = 180n - 360$

$S = 180(n - 2)$

Action!

Angle Relationships in Polygons

Interior Angle Theorem

The sum of the interior angles of a polygon (S) is $S = 180(n - 2)$ where n is the number sides.

Consolidation

Interior Angle Theorem

The sum of the interior angles of a polygon (S) is S = 180(n - 2) where n is the number sides.

What is the sum of the interior angles of a 21-sided polygon?

$S = 180(21-2)$

$S = 180(19)$

$S = 3420$

Consolidation

Whiteboards!

Interior Angle Theorem

The sum of the interior angles of a polygon (S) is S = 180(n - 2) where n is the number sides.

What is the sum of the interior angles of a 30-sided polygon?

180×28

$= 5040$

Consolidation

Whiteboards!

Interior Angle Theorem

The sum of the interior angles of a polygon (S) is $S = 180(n - 2)$ where n is the number sides.

If the sum of the interior angles of a polygon is $6300°$, how many sides does the polygon have?

$$\frac{S}{180} = \frac{180(n-2)}{180}$$

$$n - 2 = \frac{S}{180} + 2$$

$$+2 \quad +2$$

$$n = \frac{S}{180} + 2$$

Consolidation

Whiteboards!

Interior Angle Theorem

The sum of the interior angles of a polygon (S) is S = 180(n - 2) where n is the number sides.

If the sum of the interior angles of a polygon is 10,620°, how many sides does the polygon have?

~~57~~ ~~59~~ 61