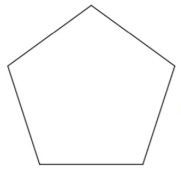
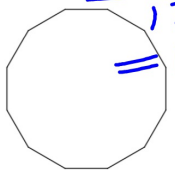
Find the measure of one interior angle in each regular polygon. Round your answer to the nearest tenth if necessary.

1) $\frac{180(n-2)}{5}$



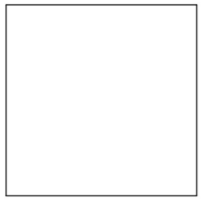
$= 108°$

2) $\frac{180(12-2)}{12}$



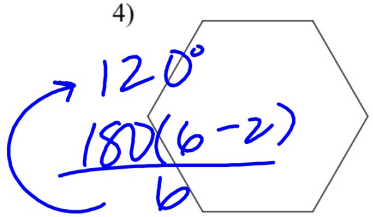
$= 150°$

3)



$90°$

4)

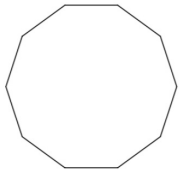


$120°$

$\frac{180(6-2)}{6}$

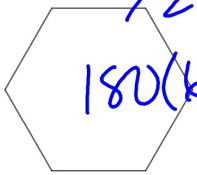
Find the interior angle sum for each polygon. Round your answer to the nearest tenth if necessary.

5) $180(10-2)$



$1440°$

6)

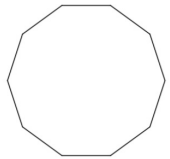


$720°$

$180(6-2)$

Find the measure of one exterior angle in each regular polygon. Round your answer to the nearest tenth if necessary.

7)



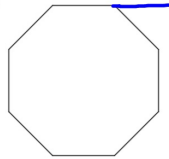
144

$\frac{180(10-2)}{10}$

$= 144$

$ext = 36°$

8) $\frac{180(8-2)}{8}$



$135°$

$45°$

EXAMPLE 5 **Try It! Find the Measures of Interior Angles**

5. The measure of each interior angle of a regular 100-gon is $(3x + 26.4)$. What is the value of x?

HABITS OF MIND

Generalize Under what circumstances would you not want to divide the interior angle sum of a polygon by the number of sides? MP.8

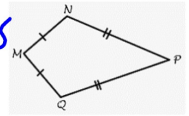
H. Geometry **6-2: Kites and Trapezoids** **Date:** _____

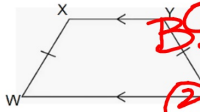
Objective: I can use triangle congruence to understand kites and trapezoids.

DEFINTIONS

A **kite** is a quad. w/ 2 pairs of consecutive sides ≅ and no pair of opp sides =

An **isosceles trapezoid** it's a trap. whose nonparallel opp. sides ≅.





B. ① QS bisects PR ② △PQR is isos

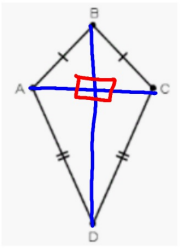
Do "Critique and Explain" and Habits of Mind in your student companion, page 137.

A. Agree
PR ⊥ QS
QP ≅ QR
SP ≅ SR
△PSR is isos

Disagree
PR bisects QS
△PQR is equil.

Fill in the essential question for this section: How are diagonals and angle measures related in kite and trapezoids

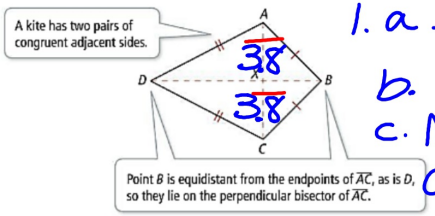
Example 1: How are the diagonals of a kite related?



1) Draw in the diagonals. Name them. $\overline{AC}$ and $\overline{BD}$

2) What is true about the diagonals?
* diagnols are ⊥ to each
* B & D are equidistant from vertex A & C

3) How could we verify that?
Based on the diagram, the tick marks



1. a. 90°
b. 7.6
c. NO AC does not bisect BD.

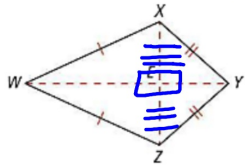
STUDY TIP
Remember that you must show that both B and D are on the perpendicular bisector in order to show that one diagonal is the perpendicular bisector of the other. It is not sufficient to show that only one is on the perpendicular bisector.

The diagonals of a kite are perpendicular to each other. Exactly one diagonal bisects the other.

Do Try It 1, page 138 in your student companion. Use kite ABCD from page 1 of your notes.

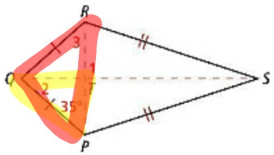
Theorem 6-3: The diagonals in a kite are perpendicular

If...



Then... $\overline{WY} \perp \overline{XZ}$

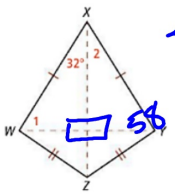
Example 2: Quadrilateral PQRS is a kite with diagonals $\overline{QS}$ and $\overline{PR}$.



a) What is $m\angle 1$? Why?	b) What is $m\angle 2$? Why?	c) What is $m\angle 3$? Why?
90. b/c diagnds are ⊥.	∠2 = 55° b/c of △ ∠ sum thm	∠3 = 35° b/c △PQR is ISOS base ∠s are ≅

Do Try It 2 and Habits of Mind, page 138 in your student companion.

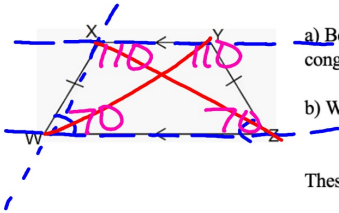
~~Can you determine $m\angle WZX$ from the information given? Explain.~~



2. a. 58°
b. 32°

COMMON ERROR
You may incorrectly assume angles are congruent just from their appearance. Always check that you can prove congruence first.

Example 3: Explore properties of an isosceles trapezoid.



a) Because an isosceles trapezoid has 2 congruent sides, there must be congruent angles

b) Which angles do you think are congruent in the figure?

$\angle W \cong \angle Z$

These angles are called the base angles.

c) What kind of angles are $\angle X$ and $\angle W$? Is there another pair of similar type angles?

SSI

$\angle Y$ & $\angle Z$

d) Draw in the diagonals of the figure. Name them: $\overline{XZ}$ and $\overline{WY}$.

What do you think is true about these diagonals? Can we verify that?

$\cong$

BY CPCTC

$\angle ZWX \cong \angle WZY$

$WZ \cong WZ$ Refl.

By SAS $\triangle ZWX \cong \triangle WZY$

e) If $m\angle W = 70°$, find the measures of the remaining angles.

$\angle W = 70$

$\angle X = 110$

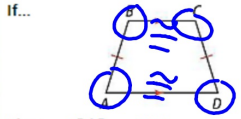
$\angle Y = 110$

$\angle Z = 70$

Do Try It 3, page 139 in your student companion.

Theorem 6-4: In an isos. trapezoid each pair of base $\angle$s are $\cong$

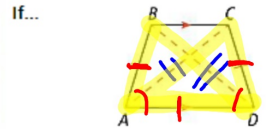
If...



Then... $\angle BAD \cong \angle CDA$, $\angle ABC \cong \angle DCB$

Theorem 6-5: the diag. in an isos. are $\cong$.

If...



Then... $\overline{AC} \cong \overline{DB}$