Angles of Polygons

Find the sum of the measures of the interior angles of each convex polygon.

1. 11-gon

$180(11-2)$

$= 1620°$

$180(n-2)$

$\dfrac{180(n-2)}{n}$

2. 14-gon

$180(14-2)$

$180(12)$

$2160°$

3. 17-gon

$180(17-2)$

$180(15)$

$2700°$

The measure of an interior angle of a regular polygon is given. Find the number of sides in the polygon.

4. 144

$144 = \dfrac{180(n-2)}{n}$

$144n = 180n - 360$

$-36n = -360$

$n = 10$

5. 156 $n = 15$

6. 160 $n = 18$

Find the measure of each interior angle.

7.

J, K, N, M trapezoid with angles $(2x+15)°$, $(3x+20)°$, $(x+5)°$, and labeled 50°

Handwritten: 115°, 130°, 65°, 50°

$$7x + 10 = 360$$
$$7x = 350$$
$$x = 50$$

8.

Parallelogram R, S, U, T with angles $(6x-4)°$, $(2x+8)°$, $(2x+8)°$, $(6x-8)°$

Handwritten: 128°, 52°, 52°, 128°
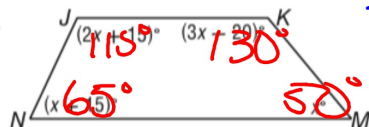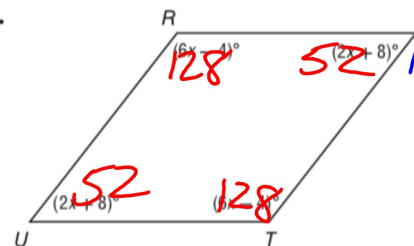
$$16x + 8 = 360$$
$$16x = 352$$
$$x = 22$$

Find the measures of an exterior angle and an interior angle given the number of sides of each regular polygon. Round to the nearest tenth, if necessary.

9. 16

$$\frac{180(16-2)}{16}$$
$$= 157.5°$$
$$22.5°$$

10. 24

165°
15°

11. 30

168°
12°

12. 14

154.3°
25.7°

13. 22

163.6°
16.4°

14. 40

171°
9°

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

<u>**Objective:**</u> I can use triangle congruence to understand kites and trapezoids.

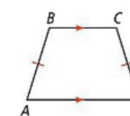| DEFINTIONS |
| --- |
| A **kite** |
| An **isosceles trapezoid** |
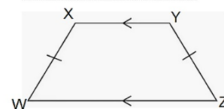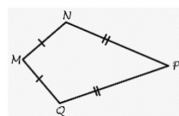
Do "Critique and Explain" and Habits of Mind in your student companion, page 137.

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

Theorem 6-4: In an isos. trapezoid the base angles are ≅
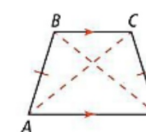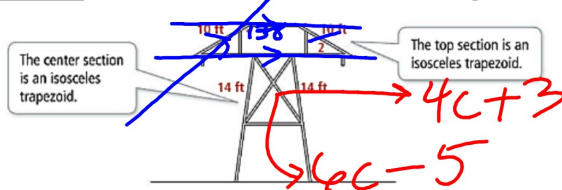
If... ∠BAD ≅ ∠CDA,
∠ABC ≅ ∠DCB

Theorem 6-5: The diagonals in an isos. trap. are ≅.

If...

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

Example 4: All horizontal beams of transmission tower are parallel to the ground.

The center section is an isosceles trapezoid.

The top section is an isosceles trapezoid.

14 ft   14 ft

$\rightarrow 4c+3$

$\rightarrow 6c-5$

A) If $m\angle 1 = 138°$, what is $m\angle 2$? $42°$

B) One cross support in the center of the tower measures $4c + 3$, and the other measures $6c - 5$. What is the length of each cross support?
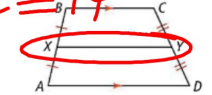
$19 ft$ $19 ft$

$4c+3=6c-5$

$3=2c-5$

$8=2c \quad c=4$

Do Try It 4 and Habits of Mind, page 139 in your student companion. $2a-1=a+13$

$a=14$

Note: A midsegment is

Theorem 6-6: Trapezoid Midsegment Theorem

In a trapezoid, the midsegment is
parallel to the *bases* and is
half the *sum* of the length of the bases.

Then... $\overline{XY} \parallel \overline{AD}$, $\overline{XY} \parallel \overline{BC}$,
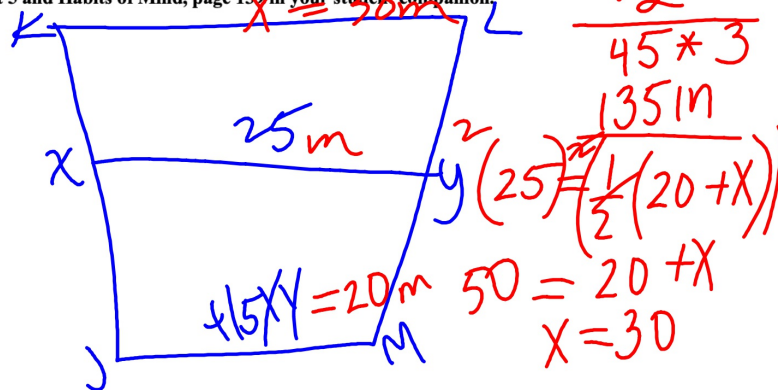and $XY = \frac{1}{2}(AD + BC)$

$XY = \frac{1}{2}(AD+BC)$

Example 5: Paxton makes trapezoidal handbags for her friends. She stiches decorative trim along the top, middle, and bottom of both sides of the handbag. How much trim does she need for 3 handbags?

$x = \frac{1}{2}(6+9)$

$= \frac{1}{2}(15) = 7.5$

$6 + 7.5 + 9 = 22.5$

$\cdot 2$

$45 * 3$

$135 in$

Do Try It 5 and Habits of Mind, page 139 in your student companion.

$X = 30 m$

$25m$

$(25 = \frac{1}{2}(20+X))$

$+(5)XY = 20 m$ $50 = 20 + X$

$X = 30$

In your Book

Read Concept Summary and #1-11 page 259 (page 140 in your student companion).
Tomorrow's assignment is page 260 #14, 16, 17, 19, 20, 22 (1760 yd = 1 mile), 24, 25, 26A