

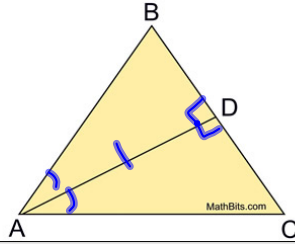
Bell Work - Complete the proof (not in book)

3.

Given: \overline{AD} bisects $\angle BAC$

$\overline{AD} \perp \overline{BC}$

Prove: $\triangle ADB \cong \triangle ADC$



| Statements | Reasons |
|--|-----------|
| 1. \overline{AD} bisects $\angle BAC$ $\overline{AD} \perp \overline{BC}$ | 1. Reason |
| 2. $\angle BAD \cong \angle CAD$ | 2. Reason |
| 3. $\angle ADB, \angle ADC$ right angles | 3. Reason |
| 4. $\angle ADB \cong \angle ADC$ | 4. Reason |
| 5. $\overline{AD} \cong \overline{AD}$ | 5. Reason |
| 6. $\triangle ADB \cong \triangle ADC$ | 6. Reason |

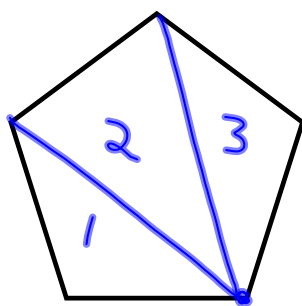
Given
 Def. of Bisector
 Def. of Perp. Lines
 All right ang. 90°
 Reflexive Prop
 ASA

7.1 Interior and Exterior Angles of Polygons

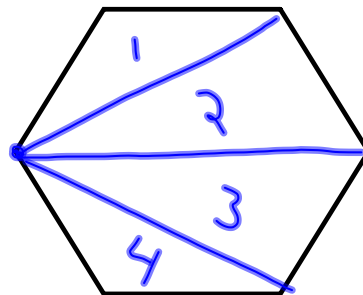
Triangle Sum Theorem: the sum of the angle measures of a triangle is 180°

Question: Is it possible for a triangle to have 2 obtuse angles? Why or why not?

Polygon Angle Sum Theorem: the sum of the measures of the interior angles of a convex polygon with n sides is $(n - 2)180^\circ$



$$(5-2) \cdot 180$$
$$3 \cdot 180$$



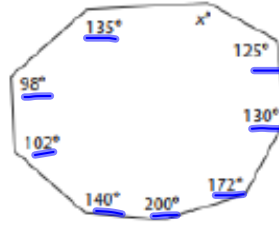
$$(6-2) \cdot 180$$
$$4 \cdot 180$$

For the nonagon shown, find the value of x .

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$$(9-2) \cdot 180$$
$$7 \cdot 180$$

$$x + 1,102 = 1,260$$
$$\begin{array}{r} -1,102 \quad -1,102 \\ \hline x = 158^\circ \end{array}$$



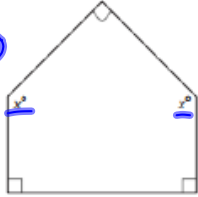
(8)

Determine the unknown interior angle measure of a convex octagon in which the measures of the seven other angles have a sum of 940° .

$$(n-2) \cdot 180 = (8-2) \cdot 180 = 1,080$$

$$x + 940 = 1,080$$
$$\begin{array}{r} -940 \quad -940 \\ \hline x = 140^\circ \end{array}$$

6. Determine the unknown angle measures in this pentagon.

$$\begin{array}{r}
 2x + 270 = 540 \\
 -270 \quad -270 \\
 \hline
 2x = 270 \\
 \frac{2x}{2} = \frac{270}{2} \\
 x = 135^\circ
 \end{array}$$


$$\begin{array}{r}
 (5-2) \cdot 180 \\
 540
 \end{array}$$

7. Determine the measure of the fourth interior angle of a quadrilateral if you know the other three measures are 89° , 80° , and 104° .

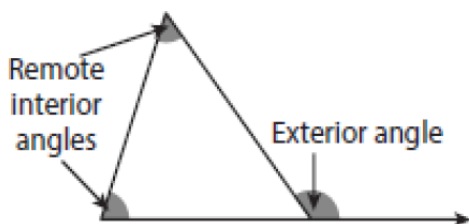
$$\begin{array}{r}
 (4-2) \cdot 180 \\
 x + 273 = 360 \\
 -273 \quad -273 \\
 \hline
 x = 87^\circ
 \end{array}$$

8. Determine the unknown angle measures in a hexagon whose six angles measure 69° , 108° , 135° , 204° , 42° , and $2b^\circ$.

$$\begin{array}{r}
 (6-2) \cdot 180 \\
 3b + 516 = 720 \\
 -516 \quad -516 \\
 \hline
 3b = 204 \\
 \frac{3b}{3} = \frac{204}{3}
 \end{array}$$

$$\begin{array}{l}
 b = 68^\circ \\
 2b = 136^\circ
 \end{array}$$

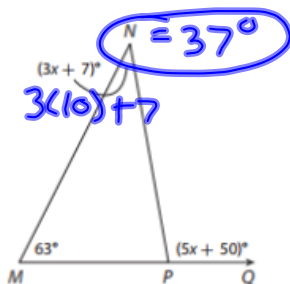
Remote interior angle: an interior angle that is not adjacent to the exterior angle.



Exterior Angle Theorem: the measure of an exterior angle of a triangle is equal to the sum of the measures of its remote interior angles.

Determine the measure of the specified angle. pg. 319

11. Determine $m\angle N$ in $\triangle MNP$.

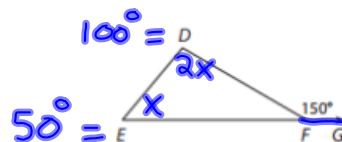


$$3x + 7 + 63 = 5x + 50$$

$$\begin{array}{r} 3x + 70 = 5x + 50 \\ -3x - 50 \quad -3x - 50 \\ \hline \end{array}$$

$$\frac{20}{2} = \frac{2x}{2} \quad 10 = x$$

12. If the exterior angle drawn measures 150° , and the measure of $\angle D$ is twice that of $\angle E$, find the measure of the two remote interior angles.



$$x + 2x = 150$$

$$\frac{3x}{3} = \frac{150}{3}$$

$$x = 50$$

7.2 Equilateral and Isosceles Triangles

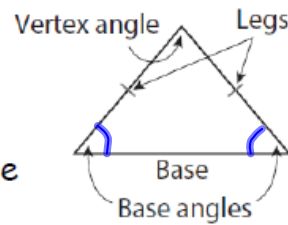
Isosceles triangle- a triangle with at least 2 congruent sides

Legs- the congruent sides

Vertex angle- the angle formed by the legs

Base- the side opposite of the vertex angle

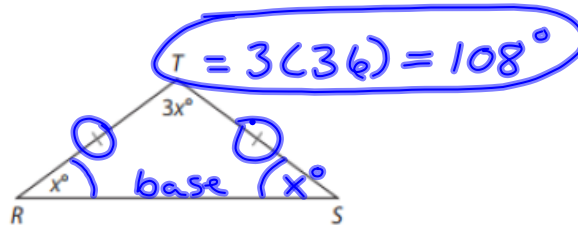
Base angles- angles that form the base



Isosceles Triangle Theorem

If two sides of a triangle are congruent, then the two angles opposite the sides are congruent.

Ⓑ m∠T

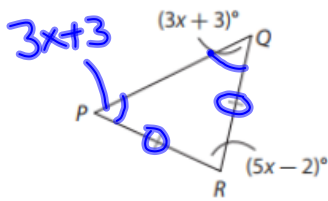


$$x + x + 3x = 180$$

$$\frac{5x}{5} = \frac{180}{5}$$

$$x = 36$$

5. Find $m\angle P$.



$$\angle P = 3(16) + 3 = 51^\circ$$

$$\underline{3x+3} + \underline{3x+3} + \underline{5x-2} = 180$$

$$\begin{array}{r} 11x + 4 = 180 \\ -4 \quad -4 \\ \hline 11x = 176 \\ \underline{\quad} \quad \underline{\quad} \\ x = 16 \end{array}$$

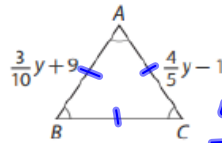
An **equilateral triangle** is a triangle with three congruent sides.

An **equiangular triangle** is a triangle with three congruent angles.

Equilateral Triangle Theorem

If a triangle is equilateral, then it is equiangular.

6. Katie's tutorial service is going so well that she is having shirts made with the equilateral triangle emblem. She has given the t-shirt company these dimensions. What is the length of each side of the triangle in centimeters?



$$\begin{array}{r} \frac{3}{10}y + 9 \\ - \frac{3}{10}y \\ \hline 9 \end{array} = \begin{array}{r} \frac{4}{5}y - 1 \\ - \frac{3}{10}y + 1 \\ \hline \frac{1}{10}y \end{array}$$

$$\frac{9}{\frac{1}{2}} = \frac{\frac{1}{10}y}{\frac{1}{2}}$$

$$20 = y$$

$$\frac{4}{5}(20) - 1 = 16 - 1 = 15$$

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pg. 334-335 #4-11

