Polygons
Quiz 1 Prep

MATH 2304
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1. Complete the table below, by writing the number of sides in the polygon named. Use the formulas, which follow, to find the sum of the interior angles and the sum of the exterior angles:

Let $S = \text{Sum of the interior angles of any polygon}$

$S = (n - 2) \times 180^\circ$

Let $T = \text{sum of the exterior angles in any polygon}$, then

$T = 360^\circ$

<table>
<thead>
<tr>
<th>Name of Polygon</th>
<th>Number of Sides</th>
<th>Sum of the Interior Angles</th>
<th>Sum of the Exterior Angles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangle</td>
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<tr>
<td>Pentagon</td>
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<tr>
<td>Heptagon</td>
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<tr>
<td>Quadrilateral</td>
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<td>Dodecagon</td>
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<td>Octagon</td>
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<td>Decagon</td>
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<td>Hexagon</td>
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<tr>
<td>Nonagon</td>
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<tr>
<td>Trapezoid</td>
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</tbody>
</table>
2. Complete the table below, by using the formulas, which follow, to find the interior angle, the exterior angle, and the central angle of each regular polygon.

Let $\Phi$ = Interior angle of a regular polygon, then

$$\Phi = \frac{S}{n}$$

Let $\Psi$ = exterior angle of a regular polygon, then

$$\Psi = \frac{360^\circ}{n}$$

Let $\Theta$ = the central angle of a regular polygon and $n$ = the number of sides of a regular polygon, then

$$\Theta = \frac{360^\circ}{n},$$

Let $S$ = Sum of the interior angles of any polygon

$$S = (n - 2) \times 180^\circ$$

Let $T$ = sum of the exterior angles in any polygon, then

$$T = 360^\circ$$

<table>
<thead>
<tr>
<th>Number of Sides in the Regular Polygon</th>
<th>Interior Angle</th>
<th>Exterior Angle</th>
<th>Central Angle</th>
</tr>
</thead>
<tbody>
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<td>3</td>
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</tbody>
</table>
Some Properties of Triangles

**Theorem 1**: The sum of the interior angles in any triangle is 180°.

**Theorem 2**: The exterior angle of a triangle is equal to the sum of the two remote interior angles of the triangle.

**Theorem 3**: In an isosceles triangle, the base angles are equal.

**Example 1**: The sum of the interior angles in any triangle is 180°.

(a) Find: \( \angle A = \) _____
\( \angle B = \) _____

(b) Find: \( \angle A = \) _____
\( \angle B = \) _____
\( \angle C = \) _____

(c) Find: \( \angle A = \) _____
\( \angle B = \) _____

Isosceles Rt. Triangle
Some Properties of Triangles

Theorem 2: The exterior angle of a triangle is equal to the sum of the two remote interior angles of the triangle.

Example 2

(a) Find: $\angle A = _____$

(b) Find: $\angle A = _____$
   $\angle B = _____$
   $\angle BAC = _____$

(c) Find: $\angle A = _____$
   $\angle B = _____$
   $\angle BCD = _____$
   $\angle ACB = _____$
Some Properties of Triangles

**Theorem 3:** In an isosceles triangle, the base angles are equal.

### Example 3

(a) Find: $\angle B = \_\_\_\_$

$\angle C = \_\_\_\_$

(b) Find: $\angle A = \_\_\_\_$

$\angle B = \_\_\_\_\_$

$\angle C = \_\_\_\_\_$

(c) Find: $\angle x = \_\_\_\_$

$\angle y = \_\_\_\_\_$

$\angle z = \_\_\_\_\_$

$\angle u = \_\_\_\_\_$

$\angle v = \_\_\_\_\_$
Some Properties of Quadrilaterals

Theorem 4: The sum of the interior angles in any quadrilateral is 360°.

Theorem 5: In a parallelogram, the opposite interior angles are supplementary.

Theorem 6: If a quadrilateral is inscribed in a circle, the opposite pairs of interior angles are supplementary.

Example 4:

(a) Find: \( \angle A = \) \( \angle B = \) \( \angle D = \)

(b) Find: \( \angle A = \) \( \angle B = \) \( \angle D = \)
Some Properties of Quadrilaterals

**Theorem 6:** If a quadrilateral is inscribed in a circle, the opposite pairs of interior angles are supplementary.

**Example 5**

(a) Find: 
\[ \angle C = \quad \angle D = \quad \]

(b) Find: 
\[ \angle A = \quad \angle B = \quad \angle C = \quad \angle D = \quad \]