

## Exterior Angle Sum Theorem

The outside angles of a polygon always add to equal  $180^\circ$ .

Determine the measure of each exterior angle.

**EXAMPLE**

The exterior angles of a pentagon are  $(3x + 8)^\circ$ ,  $(2x + 22)^\circ$ ,  $(x + 5)^\circ$ ,  $(3x + 18)^\circ$ , and  $(x + 7)^\circ$ .

$$\begin{aligned}(3x + 8) + (2x + 22) + (x + 5) + (3x + 18) + (x + 7) &= 360^\circ \\ 10x + 60 &= 360 \\ 10x &= 300 \\ x &= 30\end{aligned}$$

$$\begin{aligned}3x + 8 &= 3(30) + 8 = 90 + 8 = \boxed{98^\circ} & 2x + 22 &= 2(30) + 22 = 60 + 22 = \boxed{82^\circ} & x + 5 &= 30 + 5 = \boxed{35^\circ} \\ 3x + 18 &= 3(30) + 18 = 90 + 18 = \boxed{108^\circ} & x + 7 &= 30 + 7 = \boxed{37^\circ}\end{aligned}$$

1. The exterior angles of a quadrilateral are  $(x - 6)^\circ$ ,  $(x + 40)^\circ$ ,  $(2x + 10)^\circ$ , and  $(x + 16)^\circ$ .

2. The exterior angles of a hexagon are  $(2x + 14)^\circ$ ,  $(3x + 24)^\circ$ ,  $(4x - 6)^\circ$ ,  $(2x - 2)^\circ$ ,  $(4x + 2)^\circ$ , and  $(x + 8)^\circ$ .

3. The exterior angles of a pentagon are  $(4x + 13)^\circ$ ,  $(5x - 9)^\circ$ ,  $(2x + 26)^\circ$ ,  $(6x + 2)^\circ$ , and  $(3x + 28)^\circ$ .

4. The exterior angles of a triangle are  $(8x + 7)^\circ$ ,  $(3x - 5)^\circ$ , and  $(9x + 18)^\circ$ .

Name : \_\_\_\_\_

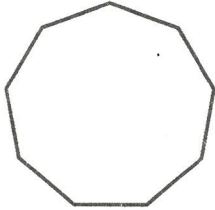
Score : \_\_\_\_\_

Teacher : \_\_\_\_\_

Date : \_\_\_\_\_

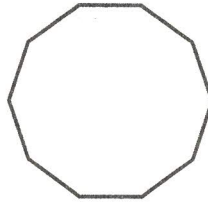
Find the measure of one interior angle, one exterior angle, and the interior angle sum for each polygon. Round your answer to the nearest tenth if necessary.

1)



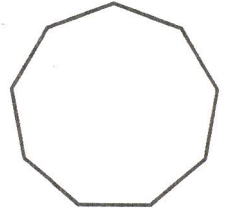
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Exterior Angle: \_\_\_\_\_  
Interior Angle Sum: \_\_\_\_\_

2)



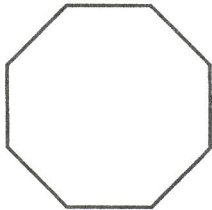
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Interior Angle Sum: \_\_\_\_\_

3)



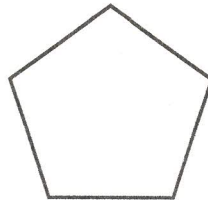
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Exterior Angle: \_\_\_\_\_  
Interior Angle Sum: \_\_\_\_\_

4)



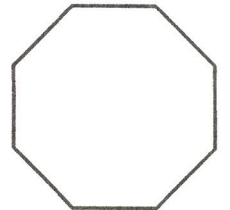
Interior Angle: \_\_\_\_\_  
Exterior Angle: \_\_\_\_\_  
Interior Angle Sum: \_\_\_\_\_

5)



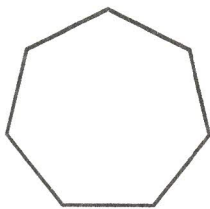
Interior Angle: \_\_\_\_\_  
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Interior Angle Sum: \_\_\_\_\_

6)



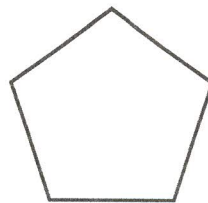
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Interior Angle Sum: \_\_\_\_\_

7)



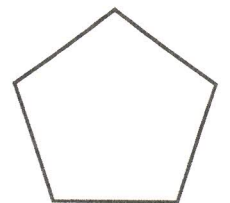
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Interior Angle Sum: \_\_\_\_\_

8)



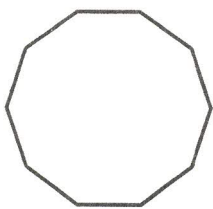
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Interior Angle Sum: \_\_\_\_\_

9)



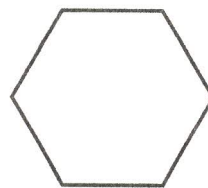
Interior Angle: \_\_\_\_\_  
Exterior Angle: \_\_\_\_\_  
Interior Angle Sum: \_\_\_\_\_

10)



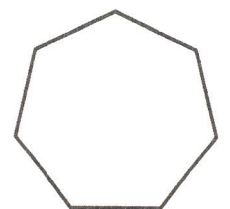
Interior Angle: \_\_\_\_\_  
Exterior Angle: \_\_\_\_\_  
Interior Angle Sum: \_\_\_\_\_

11)



Interior Angle: \_\_\_\_\_  
Exterior Angle: \_\_\_\_\_  
Interior Angle Sum: \_\_\_\_\_

12)



Interior Angle: \_\_\_\_\_  
Exterior Angle: \_\_\_\_\_  
Interior Angle Sum: \_\_\_\_\_

