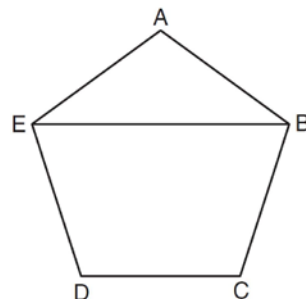


G.G.37: Interior and Exterior Angles of Polygons: Investigate, justify, and apply theorems about each interior and exterior angle measure of regular polygons

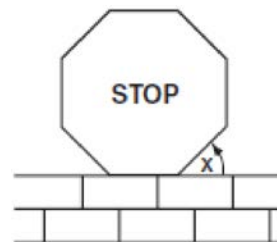
- 1 What is the measure of each interior angle in a regular octagon?
 - 1) 108°
 - 2) 135°
 - 3) 144°
 - 4) 1080°
- 2 What is the measure of an interior angle of a regular octagon?
 - 1) 45°
 - 2) 60°
 - 3) 120°
 - 4) 135°
- 3 What is the measure of each interior angle of a regular hexagon?
 - 1) 60°
 - 2) 120°
 - 3) 135°
 - 4) 270°
- 4 Determine, in degrees, the measure of each interior angle of a regular octagon.
- 5 Determine and state the measure, in degrees, of an interior angle of a regular decagon.

- 6 In the diagram below of regular pentagon $ABCDE$, \overline{EB} is drawn.



What is the measure of $\angle AEB$?

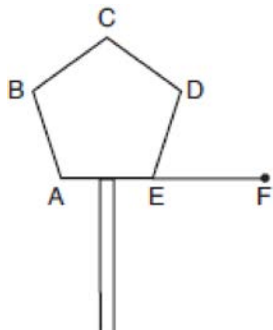
- 1) 36°
 - 2) 54°
 - 3) 72°
 - 4) 108°
- 7 What is the measure, in degrees, of each exterior angle of a regular hexagon?
 - 1) 45
 - 2) 60
 - 3) 120
 - 4) 135
 - 8 A stop sign in the shape of a regular octagon is resting on a brick wall, as shown in the accompanying diagram.



What is the measure of angle x ?

- 1) 45°
- 2) 60°
- 3) 120°
- 4) 135°

- 9 One piece of the birdhouse that Natalie is building is shaped like a regular pentagon, as shown in the accompanying diagram.



If side AE is extended to point F , what is the measure of exterior angle DEF ?

- 1) 36°
 - 2) 72°
 - 3) 108°
 - 4) 144°
- 10 What is the difference between the sum of the measures of the interior angles of a regular pentagon and the sum of the measures of the exterior angles of a regular pentagon?
- 1) 36
 - 2) 72
 - 3) 108
 - 4) 180
- 11 Find, in degrees, the measures of both an interior angle and an exterior angle of a regular pentagon.
- 12 The sum of the interior angles of a regular polygon is 720° . How many sides does the polygon have?
- 1) 8
 - 2) 6
 - 3) 5
 - 4) 4
- 13 The measure of an interior angle of a regular polygon is 120° . How many sides does the polygon have?
- 1) 5
 - 2) 6
 - 3) 3
 - 4) 4
- 14 Melissa is walking around the outside of a building that is in the shape of a regular polygon. She determines that the measure of one exterior angle of the building is 60° . How many sides does the building have?
- 1) 6
 - 2) 9
 - 3) 3
 - 4) 12
- 15 A regular polygon has an exterior angle that measures 45° . How many sides does the polygon have?
- 1) 10
 - 2) 8
 - 3) 6
 - 4) 4
- 16 A regular polygon with an exterior angle of 40° is a
- 1) pentagon
 - 2) hexagon
 - 3) nonagon
 - 4) decagon
- 17 What is the measure of the largest exterior angle that any regular polygon can have?
- 1) 60°
 - 2) 90°
 - 3) 120°
 - 4) 360°
- 18 The sum of the interior angles of a regular polygon is 540° . Determine and state the number of degrees in one interior angle of the polygon.

G.G.37: Interior and Exterior Angles of Polygons: Investigate, justify, and apply theorems about each interior and exterior angle measure of regular polygons

Answer Section

1 ANS: 2

$$(n-2)180 = (8-2)180 = 1080. \quad \frac{1080}{8} = 135.$$

REF: 081521ge

2 ANS: 4

$$(n-2)180 = (8-2)180 = 1080. \quad \frac{1080}{8} = 135.$$

REF: fall0827ge

3 ANS: 2

$$(n-2)180 = (6-2)180 = 720. \quad \frac{720}{6} = 120.$$

REF: 081125ge

4 ANS:

$$(n-2)180 = (8-2)180 = 1080. \quad \frac{1080}{8} = 135.$$

REF: 061330ge

5 ANS:

$$\frac{(n-2)180}{n} = \frac{(10-2)180}{10} = 144$$

REF: 011531ge

6 ANS: 1

$$\angle A = \frac{(n-2)180}{n} = \frac{(5-2)180}{5} = 108 \quad \angle AEB = \frac{180-108}{2} = 36$$

REF: 081022ge

7 ANS: 2

$$(n-2)180 = (6-2)180 = 720. \quad \frac{720}{6} = 120. \quad 180 - 120 = 60.$$

REF: 060213a

8 ANS: 1

$$(n-2)180 = (8-2)180 = 1080. \quad \frac{1080}{8} = 135. \quad 180 - 45 = 135.$$

REF: 080507a

9 ANS: 2

$$(n-2)180 = (5-2)180 = 540. \quad \frac{540}{5} = 108. \quad 180 - 108 = 72.$$

REF: 060718a

10 ANS: 4

$$(n-2)180 - n \left(\frac{(n-2)180}{n} \right) = 180n - 360 - 180n + 180n - 360 = 180n - 720.$$

$$180(5) - 720 = 180$$

REF: 081322ge

11 ANS:

$$(5-2)180 = 540. \quad \frac{540}{5} = 108 \text{ interior. } 180 - 108 = 72 \text{ exterior}$$

REF: 011131ge

12 ANS: 2

$$180(n-2) = 720$$

$$n - 2 = 4$$

$$n = 6$$

REF: 061521ge

13 ANS: 2

$$\frac{(n-2)180}{n} = 120 .$$

$$180n - 360 = 120n$$

$$60n = 360$$

$$n = 6$$

REF: 011326ge

14 ANS: 1

$$\text{Find an interior angle. } 180 - x = 60 . \text{ Find } n. \quad \frac{(n-2)180}{n} = 120 .$$

$$x = 120$$

$$180n - 360 = 120n$$

$$60n = 360$$

$$n = 6$$

REF: 060423a

15 ANS: 2

$$180 - \frac{(n-2)180}{n} = 45$$

$$180n - 180n + 360 = 45n$$

$$360 = 45n$$

$$n = 8$$

REF: 061413ge

16 ANS: 3

$$180 - \frac{(n-2)180}{n} = 40$$

$$180n - 180n + 360 = 40n$$

$$360 = 40n$$

$$n = 9$$

REF: 061519ge

17 ANS: 3

The regular polygon with the smallest interior angle is an equilateral triangle, with 60° . $180^\circ - 60^\circ = 120^\circ$

REF: 011417ge

18 ANS:

$$(n-2)180 = 540. \quad \frac{540}{5} = 108$$

$$n - 2 = 3$$

$$n = 5$$

REF: 081434ge