

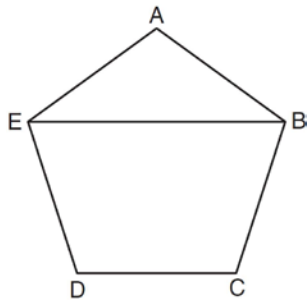
G.CO.C.11: Interior and Exterior Angles of Polygons 2b

- 1 Which type of figure is shown in the accompanying diagram?



- 2 What is the measure of each interior angle of a regular hexagon?
- 3 Determine, in degrees, the measure of each interior angle of a regular octagon.
- 4 Determine and state the measure, in degrees, of an interior angle of a regular decagon.

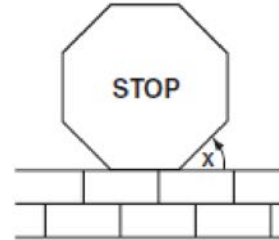
- 5 In the diagram below of regular pentagon $ABCDE$, \overline{EB} is drawn.



What is the measure of $\angle AEB$?

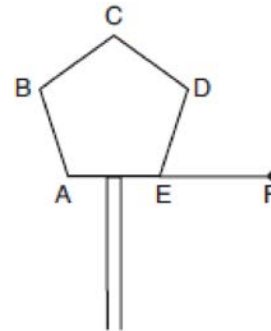
- 6 What is the measure, in degrees, of each exterior angle of a regular hexagon?

- 7 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 ?

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

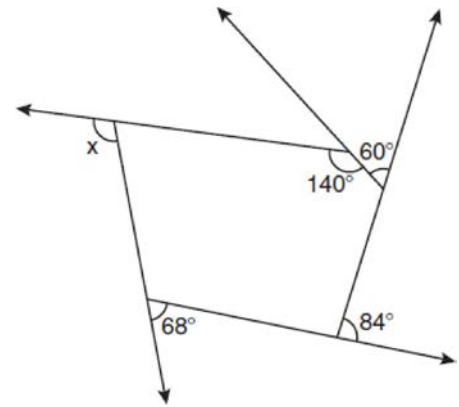


If side AE is extended to point F , what is the measure of exterior angle DEF ?

- 9 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?
- 10 Find, in degrees, the measures of both an interior angle and an exterior angle of a regular pentagon.

- 11 The sum of the interior angles of a regular polygon is 720° . How many sides does the polygon have?
- 12 The measure of an interior angle of a regular polygon is 120° . How many sides does the polygon have?
- 13 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?
- 14 A regular polygon has an exterior angle that measures 45° . How many sides does the polygon have?
- 15 A regular polygon with an exterior angle of 40° is a
- 16 What is the measure of the largest exterior angle that any regular polygon can have?
- 17 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.
- 18 The sum of the interior angles of a polygon of n sides is
- 19 The sum of the measures of the interior angles of an octagon is
- 20 What is the sum, in degrees, of the measures of the interior angles of a pentagon?

- 21 The number of degrees in the sum of the interior angles of a pentagon is
- 22 In which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?
- 23 For which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?
- 24 The pentagon in the diagram below is formed by five rays.



What is the degree measure of angle x ?

- 25 The measures of five of the interior angles of a hexagon are 150° , 100° , 80° , 165° , and 150° . What is the measure of the sixth interior angle?
- 26 If the sum of the interior angles of a polygon is 1440° , then the polygon must be

G.CO.C.11: Interior and Exterior Angles of Polygons 2b

Answer Section

1 ANS:
hexagon

REF: 060802a

2 ANS:
 120°

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

REF: 081125ge

3 ANS:

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

REF: 061330ge

4 ANS:

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

REF: 011531ge

5 ANS:
 36°

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

REF: 081022ge

6 ANS:
60

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

REF: 060213a

7 ANS:
 45°

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

REF: 080507a

8 ANS:
 72°

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

REF: 060718a

9 ANS:
180

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

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

REF: 081322ge

10 ANS:

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

REF: 011131ge

11 ANS:

6

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

$$n-2 = 4$$

$$n = 6$$

REF: 061521ge

12 ANS:

6

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

$$180n - 360 = 120n$$

$$60n = 360$$

$$n = 6$$

REF: 011326ge

13 ANS:

6

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

$$x = 120$$

$$180n - 360 = 120n$$

$$60n = 360$$

$$n = 6$$

REF: 060423a

14 ANS:

8

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

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

$$360 = 45n$$

$$n = 8$$

REF: 061413ge

15 ANS:

nonagon

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

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

$$360 = 40n$$

$$n = 9$$

REF: 061519ge

16 ANS:

120°

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

REF: 011417ge

17 ANS:

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

$$n - 2 = 3$$

$$n = 5$$

REF: 081434ge

18 ANS:

$$(n-2) \cdot 180$$

REF: 061218ge

19 ANS:

1,080°

$$(n-2)180 = (8-2)180 = 1080$$

REF: 080109a

20 ANS:

540

$$(n-2)180 = (5-2)180 = 540$$

REF: 010514a

21 ANS:

540

$$(n - 2)180 = (5 - 2)180 = 540$$

REF: 011223ge

22 ANS:

quadrilateral

sum of interior \angle s = sum of exterior \angle s

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

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

$$180n = 720$$

$$n = 4$$

REF: 081016ge

23 ANS:

quadrilateral

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

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

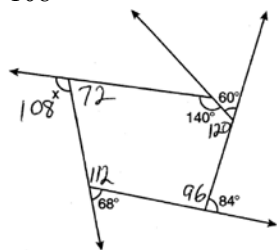
$$180n = 720$$

$$n = 4$$

REF: 081223ge

24 ANS:

108

. The sum of the interior angles of a pentagon is $(5 - 2)180 = 540$.

REF: 011023ge

25 ANS:

 75°

$$(n - 2)180 = (6 - 2)180 = 720$$

$$720 - (150 + 100 + 80 + 165 + 150) = 75$$

REF: 080820a

26 ANS:

a decagon

$$(n - 2)180 = 1440$$

$$n - 2 = 8$$

$$n = 10$$

REF: 011618ge