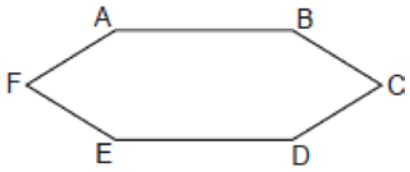
Name: _____

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

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



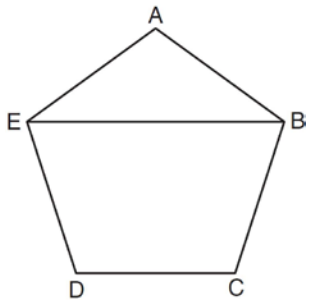
1) hexagon
2) octagon
3) pentagon
4) quadrilateral

2 What is the measure of each interior angle of a regular hexagon?
1) 60°
2) 120°
3) 135°
4) 270°

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.

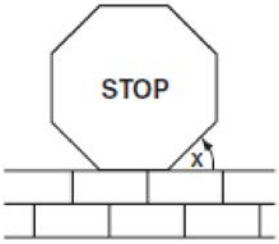
5 In the diagram below of regular pentagon *ABCDE*, $\overline{EB}$ is drawn.



What is the measure of $\angle AEB$?
1) 36º
2) 54º
3) 72º
4) 108º

6 What is the measure, in degrees, of each exterior angle of a regular hexagon?
1) 45
2) 60
3) 120
4) 135

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*?
1) 45°
2) 60°
3) 120°
4) 135°

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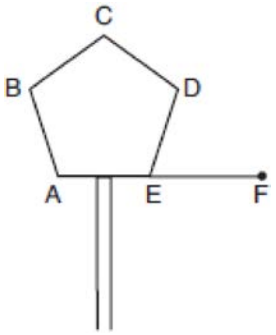
8 One piece of the birdhouse that Natalie is building is shaped like a regular pentagon, as shown in the accompanying diagram.



If side *AE* is extended to point *F*, what is the measure of exterior angle *DEF?*
1) 36°
2) 72°
3) 108°
4) 144°

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?
1) 36
2) 72
3) 108
4) 180

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?
1) 8
2) 6
3) 5
4) 4

12 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

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?
1) 6
2) 9
3) 3
4) 12

14 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

15 A regular polygon with an exterior angle of 40° is a
1) pentagon
2) hexagon
3) nonagon
4) decagon

16 What is the measure of the largest exterior angle that any regular polygon can have?
1) 60º
2) 90º
3) 120º
4) 360º

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.

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18 The sum of the interior angles of a polygon of n sides is
1) 360
2) $\frac{360}{n}$
3) $(n-2)\cdot 180$
4) $\frac{(n-2)\cdot 180}{n}$

19 The sum of the measures of the interior angles of an octagon is
1) 180°
2) 360°
3) 540°
4) 1,080°

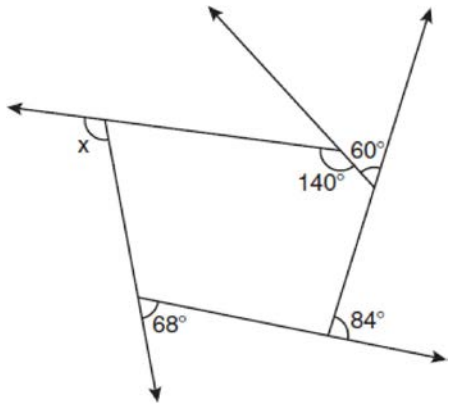
20 What is the sum, in degrees, of the measures of the interior angles of a pentagon?
1) 180
2) 360
3) 540
4) 900

21 The number of degrees in the sum of the interior angles of a pentagon is
1) 72
2) 360
3) 540
4) 720

22 In which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?
1) triangle
2) hexagon
3) octagon
4) quadrilateral

23 For which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?
1) hexagon
2) pentagon
3) quadrilateral
4) triangle

24 The pentagon in the diagram below is formed by five rays.



What is the degree measure of angle x?
1) 72
2) 96
3) 108
4) 112

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?
1) 75°
2) 80°
3) 105°
4) 180°

26 If the sum of the interior angles of a polygon is 1440°, then the polygon must be
1) an octagon
2) a decagon
3) a hexagon
4) a nonagon

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

1 ANS: 1 REF: 060802a

2 ANS: 2

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

REF: 081125ge

3 ANS:

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

REF: 061330ge

4 ANS:

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

REF: 011531ge

5 ANS: 1

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

REF: 081022ge

6 ANS: 2

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

REF: 060213a

7 ANS: 1

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

REF: 080507a

8 ANS: 2

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

REF: 060718a

9 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

10 ANS:

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

REF: 011131ge

11 ANS: 2

$180(n-2) = 720$

$n - 2 = 4$

$n = 6$

REF: 061521ge

12 ANS: 2

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

$180n - 360 = 120n$

$60n = 360$

$n = 6$

REF: 011326ge

13 ANS: 1

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: 2

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

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

$360 = 45n$

$n = 8$

REF: 061413ge

15 ANS: 3

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

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

$$360 = 40n$$

$$n = 9$$

REF: 061519ge

16 ANS: 3

The regular polygon with the smallest interior angle is an equilateral triangle, with 60º. 180° – 60° = 120°

REF: 011417ge

17 ANS:

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

$n - 2 = 3$

$n = 5$

REF: 081434ge

18 ANS: 3 REF: 061218ge

19 ANS: 4

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

REF: 080109a

20 ANS: 3

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

REF: 010514a

21 ANS: 3

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

REF: 011223ge

22 ANS: 4

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: 3

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

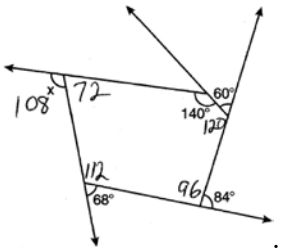
$$180n - 360 = 180n - 180n + 360$$

$$180n = 720$$

$$n = 4$$

REF: 081223ge

24 ANS: 3



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

REF: 011023ge

25 ANS: 1

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

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

REF: 080820a

26 ANS: 2

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

$$n - 2 = 8$$

$$n = 10$$

REF: 011618ge