

Geometry - Polygons

Assignment # Review

Name _____

1. State the **three** conditions which a figure must meet in order to be classified as a polygon.

1)

2)

3)

2. Your friend is working on a problem and claims that the sum of the measures of the interior angles of a convex polygon is 2070. Explain why this is not possible.

Solve.

_____ 3. Find the number of triangles ~~that can be formed from one vertex of a 57-gon~~ ^{formed by Drawing all diagonals from one vertex of a 57-gon.}

_____ 4. State the name of a polygon that has 9 sides.

_____ 5. State the name of a polygon that has x sides.

_____ 6. State the number of angles in a 15-gon.

_____ 7. Find the measure of each exterior angle in a regular decagon.

_____ 8. Find the sum of the measures of the interior angles of a regular hexagon.

_____ 9. Find the measure of each interior angle in a regular octagon.

- _____ 10. Find the number of sides in a regular polygon each of whose interior angles measures 140° .
- _____ 11. If all the interior angles of a pentagon are equal, then what is the measure of each angle?
- _____ 12. If each exterior angle of a regular polygon has a measure of 60° , how many sides does it have?
- _____ 13. Find the number of sides in a polygon in which the interior angle measure sum is 2700° .
- _____ 14. The measure of each interior angle in a hexagon is $\angle g = 2x + 5$, $\angle h = 3x - 5$, $\angle i = 4x + 20$, $\angle j = 5x + 20$, $\angle k = 3x - 5$, $\angle o = 3x + 25$. Find x .
- _____ 15. The measure of each exterior angle of a pentagon is $\angle a = t$, $\angle b = t + 15$, $\angle c = 3t + 10$, $\angle d = 5t + 20$, $\angle e = 5t + 15$. Find the $\angle c$.
- _____ 16. Three angles of a hexagon are congruent to each other. The remaining three angles are also congruent to each other, but have a measure twice that of the first three. Find the measure of each angle.
- _____ 17. The sum of the measures of six angles of a heptagon is 758° . Find the measure of the 7th angle.

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Name Key

1. State the **three** conditions which a figure must meet in order to be classified as a polygon.

- 1) lays in a plane
- 2) made up of at least 3 straight, connected sides
- 3) sides do not intersect.

2. Your friend is working on a problem and claims that the sum of the measures of the interior angles of a convex polygon is 2070. Explain why this is not possible.

$$2070 = 180(n-2)$$

$$11.5 = n-2$$

$$13.5 = n$$

not a multiple of 180°

Solve.

3. Find the number of triangles that can be formed from one diagonal in a 57-gon.
formed by drawing all diagonals from one vertex of a 57-gon

$$n-2$$

$$57-2 = 55$$

4. State the name of a polygon that has 9 sides.
nnonagon

5. State the name of a polygon that has x sides.
x-gon

6. State the number of angles in a 15-gon.
15 angles

7. Find the measure of each exterior angle in a regular decagon.

$$36^\circ$$

$$n(xm) = 360^\circ$$

$$10(xm) = 360$$

$$xm = 36$$

*Emphasize
cavalier words
- write formula*

8. Find the sum of the measures of the interior angles of a regular hexagon.

$$720^\circ$$

$$\begin{aligned} \text{Sum} &= 180(6-2) \\ &= 720 \end{aligned}$$

9. Find the measure of each interior angle in a regular octagon.

$$135^\circ$$

$$\text{Int } \angle = \frac{180(8-2)}{8} = 135^\circ$$

9 sides

10. Find the number of sides in a regular polygon each of whose interior angles measures 140° .

$$140 = \frac{180(n-2)}{n}$$

$$140n = 180n - 360$$

$$-40n = -360$$

$$n = 9$$

108°

11. If all the interior angles of a pentagon are equal, then what is the measure of each angle?

$$\text{Int } \angle = \frac{180(5-2)}{5} = 108^\circ$$

6 sides

12. If each exterior angle of a regular polygon has a measure of 60° , how many sides does it have?

$$n(60^\circ) = 360$$

$$n = 6$$

17 sides

13. Find the number of sides in a polygon in which the interior angle measure sum is 2700.

$$2700 = 180(n-2)$$

$$15 = n-2$$

$$17 = n$$

$x=33$

14. The measure of each interior angle in a hexagon is $\angle g = 2x + 5$, $\angle h = 3x - 5$, $\angle i = 4x + 20$, $\angle j = 5x + 20$, $\angle k = 3x - 5$, $\angle o = 3x + 25$. Find x .

$$20x + 60 = 720$$

$$\begin{array}{r} -60 \quad -60 \\ \hline \end{array}$$

$$20x = 660$$

$$x = 33$$

70°

15. The measure of each exterior angle of a pentagon is $\angle a = t$, $\angle b = t + 15$, $\angle c = 3t + 10$, $\angle d = 5t + 20$, $\angle e = 5t + 15$. Find the $\angle c$.

$$15t + 60 = 360$$

$$15t = 300$$

$$t = 20$$

$$\angle c = 3(20) + 10$$

$$\angle c = 60 + 10$$

$$= 70$$

$80^\circ, 160^\circ$

16. Three angles of a hexagon are congruent to each other. The remaining three angles are also congruent to each other, but have a measure twice that of the first three. Find the measure of each angle.

$$x, 2x$$

$$3(x) + 3(2x) = 720$$

$$3x + 6x = 720$$

$$9x = 720$$

$$x = 80$$

$80^\circ, 160^\circ$

142°

17. The sum of the measures of six angles of a heptagon is 758° . Find the measure of the 7th angle.

$$\text{Sum} = 180(7-2)$$

$$= 900$$

$$\begin{array}{r} 900 \\ - 758 \\ \hline \end{array}$$

$$142$$