

Polygon & Angle Pairs

Geometry · Grade 7

Score: _____ / 10

★ Hard · 10 Questions

Solve each problem. Show your work in the space provided. Write your answer on the line.

- Find the missing angle in a quadrilateral with angles 95° , 110° , 75° , and $___\circ$.

Answer: _____

- Find the sum of interior angles of a hexagon.

Answer: _____

3. Each interior angle of a regular polygon is 108° .
How many sides does it have?

Answer: _____

4. A regular polygon has an interior angle of 150° .
How many sides does it have?

Answer: _____

5. A polygon has interior angle sum of $1,440^\circ$.
How many sides does it have?

Answer: _____

6. A triangle has angles in the ratio 1:2:3.

Find each angle.

Answer: _____

7. The angles of a quadrilateral are in the ratio 2:3:4:6.

Find each angle.

Answer: _____

8. Two supplementary angles are in ratio 5:7.

Find each angle.

Answer: _____

9. Each interior angle of a regular polygon measures 156° . How many sides does it have?

Answer: _____

10. A polygon has interior angle sum of $2,160^\circ$. How many sides?

Answer: _____

Answer Key

Polygon & Angle Pairs — Hard

1. 80°

Sum of quadrilateral angles = 360°. $360^\circ - 95^\circ - 110^\circ - 75^\circ = 80^\circ$.

2. 720°

Sum = $(n-2) \times 180^\circ = (6-2) \times 180^\circ = 4 \times 180^\circ = 720^\circ$.

3. 5 sides (regular pentagon)

Each angle = $(n-2) \times 180^\circ / n = 108^\circ$. Solve: $(n-2) \times 180 = 108n \rightarrow 180n - 360 = 108n \rightarrow 72n = 360 \rightarrow n = 5$.

4. 12 sides

Interior angle = $(n-2) \times 180 / n = 150$. $180n - 360 = 150n$. $30n = 360$. $n = 12$.

5. 10 sides

$(n-2) \times 180 = 1,440$. $n-2 = 8$. $n = 10$.

6. 30°, 60°, 90°

Ratio parts sum to $1+2+3=6$. Each part = $180^\circ \div 6 = 30^\circ$. Angles: $30^\circ, 60^\circ, 90^\circ$.

7. 48°, 72°, 96°, 144°

Sum of ratio parts = $2+3+4+6=15$. One part = $360^\circ \div 15 = 24^\circ$. Angles: $48^\circ, 72^\circ, 96^\circ, 144^\circ$.

8. 75° and 105°

$5k+7k=12k=180^\circ$. $k=15^\circ$. Angles: $5 \times 15 = 75^\circ$ and $7 \times 15 = 105^\circ$.

9. 15 sides

Interior angle = $(n-2) \times 180 / n = 156$. $180n - 360 = 156n$. $24n = 360$. $n = 15$.

10. 14 sides

$(n-2) \times 180 = 2,160$. $n-2 = 12$. $n = 14$.