

# Interior Angles of Polygons

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 24

## Q Quick Review

For any polygon with  $n$  sides, the **interior angles add up to**  $(n - 2) \times 180^\circ$ . The idea: you can split the polygon into  $(n - 2)$  triangles, and each triangle contributes  $180^\circ$ . If the polygon is **regular** (all sides and angles equal), each interior angle is the total divided by  $n$ :  $\frac{(n-2) \times 180^\circ}{n}$ . The **exterior angles** of any polygon always add to  $360^\circ$ , so each exterior angle of a regular polygon is  $\frac{360^\circ}{n}$ .

◇ **Example:** Find the sum of the interior angles of a hexagon (6 sides).  
 ⇒ The formula for the sum of interior angles is  $(n - 2) \times 180^\circ$ . A hexagon has  $n = 6$  sides, so first compute  $n - 2 = 6 - 2 = 4$ . That tells us the hexagon splits into 4 triangles. Now multiply by  $180^\circ$ :  $4 \times 180^\circ = 720^\circ$ . So all six interior angles together measure  $720^\circ$ .

**Answer:**  $720^\circ$

## PRACTICE

Find the requested angle sum or angle measure.

- |   |       |  |       |
|---|-------|--|-------|
| 1. Interior angle sum: triangle           | _____ | 12. Each interior angle: regular hexagon                                     | _____ |
| 2. Interior angle sum: quadrilateral      | _____ | 13. Each interior angle: regular octagon                                     | _____ |
| 3. Interior angle sum: pentagon           | _____ | 14. Each interior angle: regular 12-gon                                      | _____ |
| 4. Interior angle sum: hexagon            | _____ | 15. Each interior angle: regular nonagon                                     | _____ |
| 5. Interior angle sum: heptagon (7 sides) | _____ | 16. Each exterior angle: regular hexagon                                     | _____ |
| 6. Interior angle sum: octagon            | _____ | 17. Each exterior angle: regular octagon                                     | _____ |
| 7. Interior angle sum: nonagon (9 sides)  | _____ | 18. Each exterior angle: regular decagon                                     | _____ |
| 8. Interior angle sum: decagon (10 sides) | _____ | 19. Quadrilateral with angles $90^\circ, 100^\circ, 80^\circ, ?$             | _____ |
| 9. Interior angle sum: 12-gon             | _____ | 20. Pentagon with four angles $100^\circ, 110^\circ, 120^\circ, 90^\circ, ?$ | _____ |
| 10. Interior angle sum: 15-gon            | _____ |  |       |
| 11. Each interior angle: regular pentagon | _____ |  |       |

## ◆ Word Problems

21. A stop sign is a regular octagon. What is the measure of each of its interior angles? \_\_\_\_\_
22. A floor tile is a regular hexagon. Three hexagonal tiles meet at a point. Show that they fit perfectly with no gap. \_\_\_\_\_
23. A quadrilateral window has angles of  $85^\circ, 95^\circ, \text{ and } 100^\circ$ . What is the measure of its fourth angle? \_\_\_\_\_
24. A regular polygon has each interior angle equal to  $150^\circ$ . How many sides does it have? \_\_\_\_\_



## Answer Keys

- |   |  |
|---|--|
| <p>1. <math>180^\circ</math></p> <p>2. <math>360^\circ</math></p> <p>3. <math>540^\circ</math></p> <p>4. <math>720^\circ</math></p> <p>5. <math>900^\circ</math></p> <p>6. <math>1080^\circ</math></p> <p>7. <math>1260^\circ</math></p> <p>8. <math>1440^\circ</math></p> <p>9. <math>1800^\circ</math></p> <p>10. <math>2340^\circ</math></p> <p>11. <math>108^\circ</math></p> <p>12. <math>120^\circ</math></p> | <p>13. <math>135^\circ</math></p> <p>14. <math>150^\circ</math></p> <p>15. <math>140^\circ</math></p> <p>16. <math>60^\circ</math></p> <p>17. <math>45^\circ</math></p> <p>18. <math>36^\circ</math></p> <p>19. <math>90^\circ</math></p> <p>20. <math>120^\circ</math></p> <p>21. <math>135^\circ</math></p> <p>22. Yes; <math>3 \times 120^\circ = 360^\circ</math></p> <p>23. <math>80^\circ</math></p> <p>24. 12 sides</p> |
|---|--|

### Step-by-Step Explanations

- |   |  |
|---|--|
| <p>1. <math>(3 - 2) \times 180 = 180^\circ</math>.</p> <p>2. <math>(4 - 2) \times 180 = 360^\circ</math>.</p> <p>3. <math>(5 - 2) \times 180 = 540^\circ</math>.</p> <p>4. <math>(6 - 2) \times 180 = 720^\circ</math>.</p> <p>5. <math>(7 - 2) \times 180 = 900^\circ</math>.</p> <p>6. <math>(8 - 2) \times 180 = 1080^\circ</math>.</p> <p>7. <math>(9 - 2) \times 180 = 1260^\circ</math>.</p> <p>8. <math>(10 - 2) \times 180 = 1440^\circ</math>.</p> <p>9. <math>(12 - 2) \times 180 = 1800^\circ</math>.</p> <p>10. <math>(15 - 2) \times 180 = 2340^\circ</math>.</p> <p>11. <math>540 \div 5 = 108^\circ</math>.</p> <p>12. <math>720 \div 6 = 120^\circ</math>.</p> <p>13. <math>1080 \div 8 = 135^\circ</math>.</p> <p>14. <math>1800 \div 12 = 150^\circ</math>.</p> | <p>15. <math>1260 \div 9 = 140^\circ</math>.</p> <p>16. <math>360 \div 6 = 60^\circ</math>.</p> <p>17. <math>360 \div 8 = 45^\circ</math>.</p> <p>18. <math>360 \div 10 = 36^\circ</math>.</p> <p>19. The sum is <math>360^\circ</math>: <math>360 - 90 - 100 - 80 = 90^\circ</math>.</p> <p>20. The sum is <math>540^\circ</math>: <math>540 - 100 - 110 - 120 - 90 = 120^\circ</math>.</p> <p>21. The interior angle sum of an octagon is <math>(8 - 2) \times 180 = 1080^\circ</math>. Divided equally among 8 angles, each is <math>1080 \div 8 = 135^\circ</math>.</p> <p>22. Each interior angle of a regular hexagon is <math>720 \div 6 = 120^\circ</math>. Three of them give <math>3 \times 120 = 360^\circ</math>, exactly a full turn, so they fit with no gap.</p> <p>23. A quadrilateral's interior angles sum to <math>360^\circ</math>, so the fourth angle is <math>360 - 85 - 95 - 100 = 80^\circ</math>.</p> <p>24. Each exterior angle is <math>180 - 150 = 30^\circ</math>. Since exterior angles total <math>360^\circ</math>, the number of sides is <math>360 \div 30 = 12</math>.</p> |
|---|--|



## Want Even More Practice? Check Out Our Other California CAASPP Test Books!



### California CAASPP Grade 8 Math Preparation Bundle

18 full-length practice tests across three books  
(5 + 6 + 7)

No repeated questions—maximum practice value!



**18 Tests!**  
**3 Books**  
**One Bundle**

**Important:** All our test books contain **unique, completely different tests** from each other! Each book offers fresh practice questions—no repeats!

#### 5 Practice Tests

- ✓ 5 complete practice tests with detailed explanations
- ✓ Perfect foundation for CAASPP test preparation
- ✓ Builds confidence and test-taking skills
- ✓ High-quality questions aligned with state standards

**Start your practice journey!**

#### 6 Practice Tests

- ✓ 6 complete practice tests with detailed explanations
- ✓ **Unique tests**—different from the 5 tests book
- ✓ Perfect for more practice after mastering 5 tests
- ✓ Builds even more confidence and test-taking skills
- ✓ Same high-quality questions aligned with standards

**Take your practice to the next level!**

#### 7 Practice Tests

- ✓ 7 complete practice tests for maximum preparation
- ✓ **Unique tests**—different from 5 and 6 tests books
- ✓ The most comprehensive practice for Grade 8
- ✓ Ideal for students aiming for top scores
- ✓ Extensive practice builds mastery and confidence

**Go all the way with comprehensive practice!**