

Polygons

Name: _____ Date: _____ Score: _____ / 24

Quick Review and Helpful Hints

A polygon is a closed figure made of straight sides. The interior angles of a polygon with n sides add up to $(n - 2) \times 180^\circ$. In a *regular* polygon all sides and angles are equal, so each interior angle is $\frac{(n - 2) \times 180^\circ}{n}$. The perimeter is the sum of all the side lengths.

► **Example:** Find the sum of the interior angles of a hexagon (6 sides). **Work:** Use $(n - 2) \times 180^\circ$ with $n = 6$: $(6 - 2) \times 180 = 4 \times 180$.

★ **Answer:** 720°



Hexagon ($n = 6$): angle sum = 720° .

Practice Problems

Use the polygon shown to find the requested angle measure or perimeter.

1. Triangle: find the sum of the interior angles.



8. Decagon: find the sum of the interior angles.



2. Quadrilateral: find the sum of the interior angles.



9. Equilateral triangle: find each interior angle.



3. Pentagon: find the sum of the interior angles.



10. Regular pentagon with side 7: find the perimeter.



4. Octagon: find the sum of the interior angles.



11. Regular hexagon with side 5: find the perimeter.



5. Regular pentagon: find each interior angle.



12. Regular octagon: find each interior angle.



6. Regular hexagon: find each interior angle.



13. Heptagon: find the sum of the interior angles.



7. Square: find each interior angle.



14. Regular octagon with side 4: find the perimeter.





◆ Word Problems

15. A stop sign is a regular octagon with each side measuring 12 inches. What is its perimeter?



16. A regular hexagonal floor tile has each interior angle equal to how many degrees?



17. A picture frame is shaped like a regular pentagon with a side length of 9 cm. Find its perimeter.



18. What is the sum of the interior angles of a regular nonagon (9 sides)?



19. A regular hexagonal garden has side length 8 feet. Find the perimeter.



20. A regular decagonal table has 10 equal sides. What is the measure of each interior angle?



21. A regular heptagonal flower bed has each side measuring 6 meters. Find its perimeter.



22. An art mural is shaped like a regular dodecagon (12 sides). What is the sum of its interior angles?



23. A regular nonagon tile has all angles equal. What is the measure of each interior angle?



24. A regular pentagonal sign has perimeter 65 cm. What is the length of each side?



Answer Keys

- | | | | |
|---------------------------------------|---------------------------------------|--|--|
| 1. <input type="text" value="180°"/> | 7. <input type="text" value="90°"/> | 13. <input type="text" value="900°"/> | 19. <input type="text" value="48 ft"/> |
| 2. <input type="text" value="360°"/> | 8. <input type="text" value="1440°"/> | 14. <input type="text" value="32"/> | 20. <input type="text" value="144°"/> |
| 3. <input type="text" value="540°"/> | 9. <input type="text" value="60°"/> | 15. <input type="text" value="96 in"/> | 21. <input type="text" value="42 m"/> |
| 4. <input type="text" value="1080°"/> | 10. <input type="text" value="35"/> | 16. <input type="text" value="120°"/> | 22. <input type="text" value="1800°"/> |
| 5. <input type="text" value="108°"/> | 11. <input type="text" value="30"/> | 17. <input type="text" value="45 cm"/> | 23. <input type="text" value="140°"/> |
| 6. <input type="text" value="120°"/> | 12. <input type="text" value="135°"/> | 18. <input type="text" value="1260°"/> | 24. <input type="text" value="13 cm"/> |

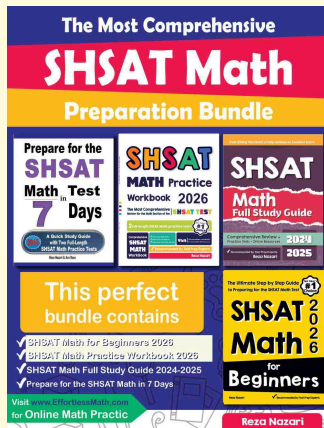
Step-by-Step Explanations

1. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The diagram is a triangle, so $n = 3$. The angle sum is $(3 - 2) \times 180 = 180^\circ$. So the final answer is 180° .
2. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The diagram has 4 sides. Use $(n - 2) \times 180$: $(4 - 2) \times 180 = 360^\circ$. So the final answer is 360° .
3. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The diagram is a pentagon, so $(5 - 2) \times 180 = 540^\circ$. So the final answer is 540° .
4. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The octagon has 8 sides: $(8 - 2) \times 180 = 1080^\circ$. So the final answer is 1080° .
5. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A regular pentagon has equal angles. Its total is 540° , so each angle is $540 \div 5 = 108^\circ$. So the final answer is 108° .
6. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A regular hexagon has total angle measure 720° ; divide by 6 to get 120° each. So the final answer is 120° .
7. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A square has 4 equal angles. The total is 360° , so each angle is $360 \div 4 = 90^\circ$. So the final answer is 90° .
8. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The diagram is a decagon, so $(10 - 2) \times 180 = 1440^\circ$. So the final answer is 1440° .
9. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is An equilateral triangle has 3 equal angles. Since the total is 180° , each angle is $180 \div 3 = 60^\circ$. So the final answer is 60° .
10. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Perimeter is number of sides times side length: $5 \times 7 = 35$. So the final answer is 35.
11. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The regular hexagon has 6 equal sides: $6 \times 5 = 30$. So the final answer is 30.
12. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A regular octagon has total angle measure 1080° , and $1080 \div 8 = 135^\circ$. So the final answer is 135° .
13. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The heptagon has 7 sides: $(7 - 2) \times 180 = 900^\circ$. So the final answer is 900° .
14. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The regular octagon has 8 sides of length 4, so $8 \times 4 = 32$. So the final answer is 32.
15. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A stop sign is a regular octagon with 8 equal sides: $8 \times 12 = 96$ inches. So the final answer is 96 in.
16. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A regular hexagon has total angle measure 720° , so each angle is $720 \div 6 = 120^\circ$. So the final answer is 120° .
17. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The picture frame is a pentagon with 5 equal sides: $5 \times 9 = 45$ cm. So the final answer is 45 cm.
18. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A nonagon has 9 sides, so $(9 - 2) \times 180 = 7 \times 180 = 1260^\circ$. So the final answer is 1260° .
19. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The garden is a regular hexagon, so it has 6 equal sides: $6 \times 8 = 48$ feet of edging. So the final answer is 48 ft.
20. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A decagon has angle sum $(10 - 2) \times 180 = 1440^\circ$; divide by 10 to get 144° . So the final answer is 144° .
21. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The flower bed is a heptagon with 7 equal sides, so $7 \times 6 = 42$ meters. So the final answer is 42 m.
22. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A dodecagon has 12 sides: $(12 - 2) \times 180 = 1800^\circ$. So the final answer is 1800° .
23. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A regular nonagon's total is 1260° , and $1260 \div 9 = 140^\circ$ for each angle. So the final answer is 140° .
24. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Divide the perimeter by the 5 equal sides: $65 \div 5 = 13$ cm per side. So the final answer is 13 cm.



Keep Building SHSAT Math Skills

Recommended Effortless Math resources



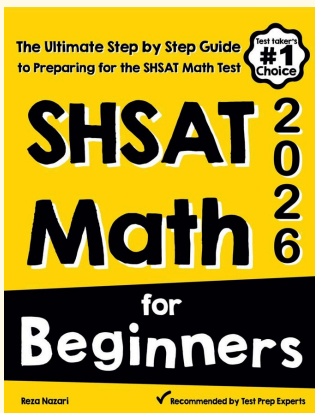
The Most Comprehensive SHSAT Math Preparation Bundle

Use the complete SHSAT Math resource for review, worked examples, extra practice, and test-style questions after each worksheet.



Scan Me
Download Instantly

STUDENT FAVORITE - SHSAT Math for Beginners



SHSAT Math for Beginners 2026

Step-by-step lessons, topic practice, and full review support for students who want a calm path through SHSAT Math preparation.

A strong companion for self-study, tutoring, homework, and targeted review.

PDF Edition



Scan Me
Download Instantly

For more SHSAT Math prep, visit EffortlessMath.com/SHSAT