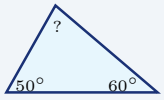
Triangles

Name: _____	Date: _____	Score: _____ / 18

Quick Review and Helpful Hints

The three angles of any triangle add up to $180°$. To find a missing angle, subtract the known angles from $180°$. The area of a triangle is $A = \frac{1}{2}\,b\,h$, where b is the base and h is the height drawn perpendicular to that base.

▷ **Example:** Two angles of a triangle are $50°$ and $60°$. Find the third angle. **Work:** All three angles add to $180°$. Add the known angles: $50 + 60 = 110$. Subtract from 180: $180 - 110 = 70$. ★ **Answer:** $70°$

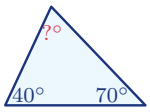


Angles sum to $180°$, so $? = 70°$.

Practice Problems

Use each diagram to find the missing angle or the area, as directed.

1. Find the missing angle.



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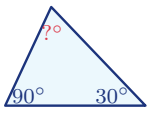
2. Find the missing angle.



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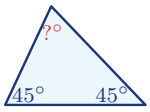
3. Find the missing angle.



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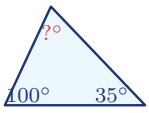
4. Find the missing angle.



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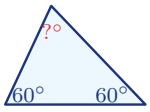
5. Find the missing angle.



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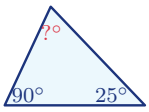
6. Find the other acute angle.



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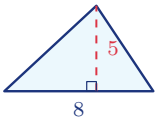
7. Find the area.



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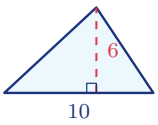
8. Find the area.



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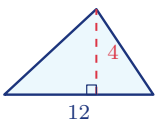
9. Find the area.



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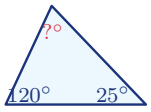
10. Find the missing angle.



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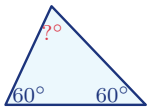
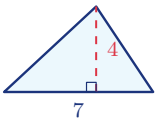
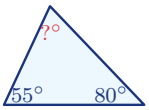
11. Find each angle of an equilateral triangle.



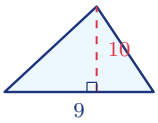
12. Find the area.



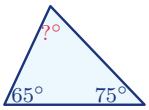
13. Find the missing angle.



14. Find the area.



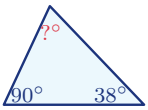
Word Problems



15. A triangular sail has angles $65°$ and $75°$. Find the third angle.

Use angle sum $= 180°$

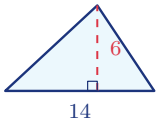
Work: _____



17. In a right triangle, one acute angle is $38°$. Find the other acute angle.

Use angle sum $= 180°$

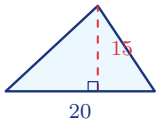
Work: _____



16. A triangular garden has base 14 ft and height 6 ft. Find its area.

Use $A = \frac{1}{2}bh$

Work: _____



18. A triangular flag has base 20 cm and height 15 cm. Find its area.

Use $A = \frac{1}{2}bh$

Work: _____

Answer Keys

1. 70°	**7.** 20	**13.** 45°
2. 60°	**8.** 30	**14.** 45
3. 90°	**9.** 24	**15.** 40°
4. 45°	**10.** 35°	**16.** $42\ \text{ft}^2$
5. 60°	**11.** 60°	**17.** 52°
6. 65°	**12.** 14	**18.** $150\ \text{cm}^2$

Step-by-Step Explanations

1. Start by naming the process: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is The three angles of a triangle always total 180°. Subtract the two you know: $180 - 40 - 70 = 70^\circ$. So the final answer is 70°.

2. A good way to think about this is: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is $180 - 90 - 30 = 60^\circ$. So the final answer is 60°.

3. Step by step: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is $180 - 45 - 45 = 90^\circ$ – this makes a right triangle. So the final answer is 90°.

4. Take it one move at a time: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is $180 - 100 - 35 = 45^\circ$. So the final answer is 45°.

5. Start by naming the process: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is $180 - 60 - 60 = 60^\circ$; all three are equal, so it's equilateral. So the final answer is 60°.

6. A good way to think about this is: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is A right triangle already has a 90° angle, so the other acute angle is $180 - 90 - 25 = 65^\circ$. So the final answer is 65°.

7. Step by step: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is Area of a triangle is $\frac{1}{2}bh$: $\frac{1}{2}(8)(5) = 20$. So the final answer is 20.

8. Take it one move at a time: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is $\frac{1}{2}(10)(6) = 30$. So the final answer is 30.

9. Start by naming the process: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is $\frac{1}{2}(12)(4) = 24$. So the final answer is 24.

10. A good way to think about this is: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is $180 - 120 - 25 = 35^\circ$. So the final answer is 35°.

11. Step by step: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is An equilateral triangle has three equal angles, so each is $180 \div 3 = 60^\circ$. So the final answer is 60°.

12. Take it one move at a time: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is $\frac{1}{2}(7)(4) = 14$. So the final answer is 14.

13. Start by naming the process: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is $180 - 55 - 80 = 45^\circ$. So the final answer is 45°.

14. A good way to think about this is: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is $\frac{1}{2}(9)(10) = 45$. So the final answer is 45.

15. Step by step: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is The third angle of the sail is $180 - 65 - 75 = 40^\circ$. So the final answer is 40°.

16. Take it one move at a time: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is Area $= \frac{1}{2}(14)(6) = 42$ square feet. So the final answer is $42\ \text{ft}^2$.

17. Start by naming the process: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is The other acute angle is $180 - 90 - 38 = 52^\circ$. So the final answer is 52°.

18. A good way to think about this is: Use the triangle angle-sum rule: the three interior angles add to 180°, then solve for the missing value. The setup/work is Area $= \frac{1}{2}(20)(15) = 150$ square cm. So the final answer is $150\ \text{cm}^2$.

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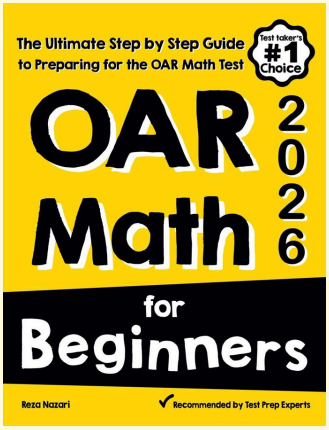

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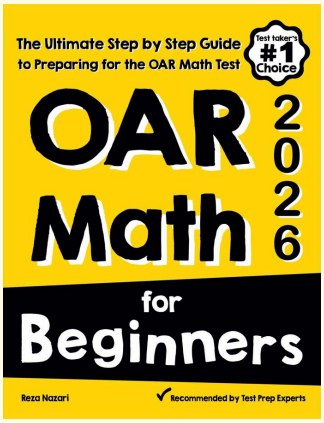

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