

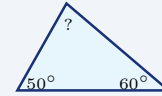
# Triangles

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 18

## Quick Review and Helpful Hints

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

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



Angles sum to  $180^\circ$ , so  $? = 70^\circ$ .

### Practice Problems

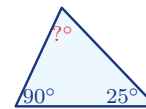
Use each diagram to find the missing angle or the area, as directed.

1. Find the missing angle.



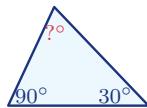
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6. Find the other acute angle.



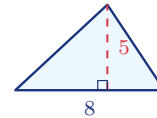
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2. Find the missing angle.



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7. Find the area.



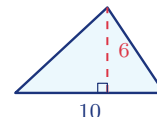
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3. Find the missing angle.



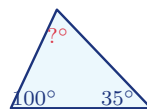
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8. Find the area.



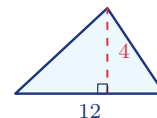
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4. Find the missing angle.



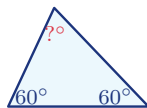
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9. Find the area.



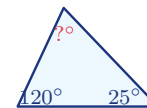
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5. Find the missing angle.

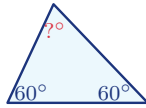


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10. Find the missing angle.

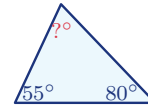


11. Find each angle of an equilateral triangle.



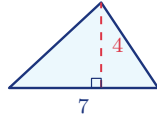
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13. Find the missing angle.



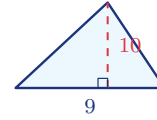
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12. Find the area.



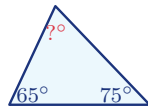
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14. Find the area.



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◆ Word Problems



15. A triangular sail has angles  $65^\circ$  and  $75^\circ$ . Find the third angle.

Use angle sum =  $180^\circ$

Work: \_\_\_\_\_

\_\_\_\_\_



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

Use angle sum =  $180^\circ$

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.  $70^\circ$

2.  $60^\circ$

3.  $90^\circ$

4.  $45^\circ$

5.  $60^\circ$

6.  $65^\circ$

7.  $20$

8.  $30$

9.  $24$

10.  $35^\circ$

11.  $60^\circ$

12.  $14$

13.  $45^\circ$

14.  $45$

15.  $40^\circ$

16.  $42 \text{ ft}^2$

17.  $52^\circ$

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  $180^\circ$ , then solve for the missing value. The setup/work is The three angles of a triangle always total  $180^\circ$ . Subtract the two you know:  $180 - 40 - 70 = 70^\circ$ . So the final answer is  $70^\circ$ .

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

**3.** Step by step: Use the triangle angle-sum rule: the three interior angles add to  $180^\circ$ , 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  $90^\circ$ .

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

**5.** Start by naming the process: Use the triangle angle-sum rule: the three interior angles add to  $180^\circ$ , 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  $60^\circ$ .

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

**7.** Step by step: Use the triangle angle-sum rule: the three interior angles add to  $180^\circ$ , 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  $180^\circ$ , 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  $180^\circ$ , 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  $180^\circ$ , then solve for the missing value. The setup/work is  $180 - 120 - 25 = 35^\circ$ . So the final answer is  $35^\circ$ .

**11.** Step by step: Use the triangle angle-sum rule: the three interior angles add to  $180^\circ$ , 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  $60^\circ$ .

**12.** Take it one move at a time: Use the triangle angle-sum rule: the three interior angles add to  $180^\circ$ , 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  $180^\circ$ , then solve for the missing value. The setup/work is  $180 - 55 - 80 = 45^\circ$ . So the final answer is  $45^\circ$ .

**14.** A good way to think about this is: Use the triangle angle-sum rule: the three interior angles add to  $180^\circ$ , 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  $180^\circ$ , 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  $40^\circ$ .

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

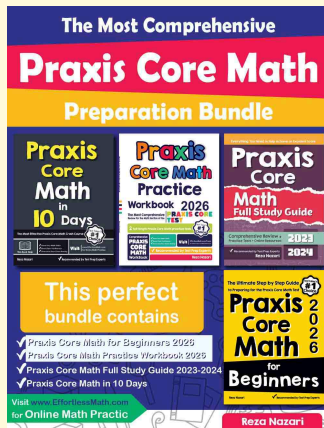
**17.** Start by naming the process: Use the triangle angle-sum rule: the three interior angles add to  $180^\circ$ , then solve for the missing value. The setup/work is The other acute angle is  $180 - 90 - 38 = 52^\circ$ . So the final answer is  $52^\circ$ .

**18.** A good way to think about this is: Use the triangle angle-sum rule: the three interior angles add to  $180^\circ$ , 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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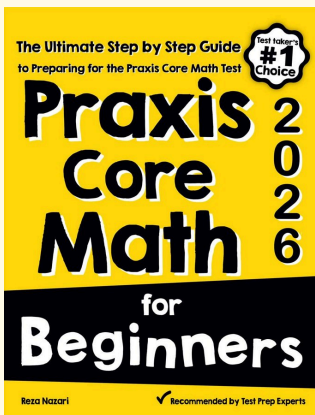
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