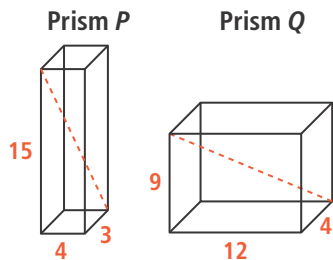


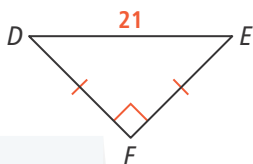


UNDERSTAND

10. **Mathematical Connections** Which rectangular prism has the longer diagonal? Explain.



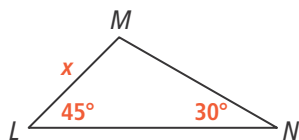
11. **Error Analysis** Dakota is asked to find EF . What is her error?



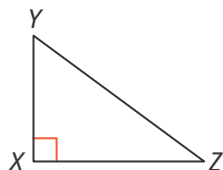
There is not enough information to find EF because you need to know either the length of $\overline{DF}$ or one of the other angle measures.



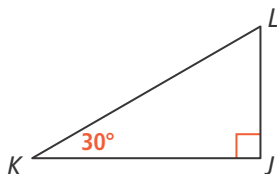
12. **Make Sense and Persevere** What are expressions for MN and LN ? *Hint:* Construct the altitude from M to $\overline{LN}$.



13. **Higher Order Thinking** Triangle XYZ is a right triangle. For what kind of triangle would $XZ^2 + XY^2 > YZ^2$? For what kind of triangle would $XZ^2 + XY^2 < YZ^2$? Explain.



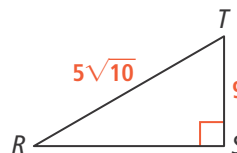
14. **Look for Relationships** Write an equation that represents the relationship between JK and KL .



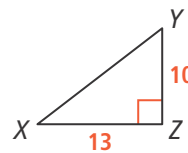
PRACTICE

For Exercises 15 and 16, find the unknown side length of each triangle. SEE EXAMPLE 1

15. RS

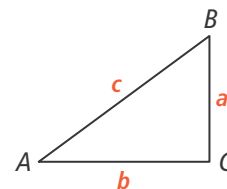


16. XY

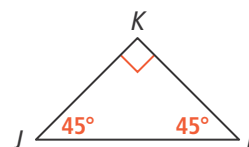


17. Given $\triangle ABC$ with $a^2 + b^2 = c^2$, write a paragraph proof of the Converse of the Pythagorean Theorem.

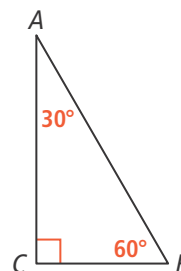
SEE EXAMPLE 2



18. Write a two-column proof of the 45° - 45° - 90° Triangle Theorem. SEE EXAMPLE 3

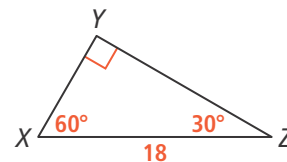
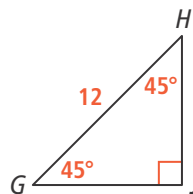


19. Write a paragraph proof of the 30° - 60° - 90° Triangle Theorem. SEE EXAMPLE 4

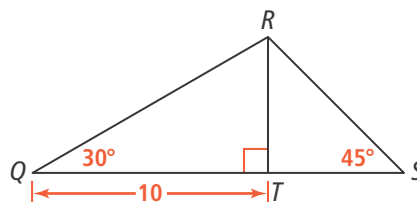


For Exercise 20 and 21, find the side lengths of each triangle. SEE EXAMPLES 3 AND 4

20. What are GJ and HJ ? 21. What are XY and YZ ?

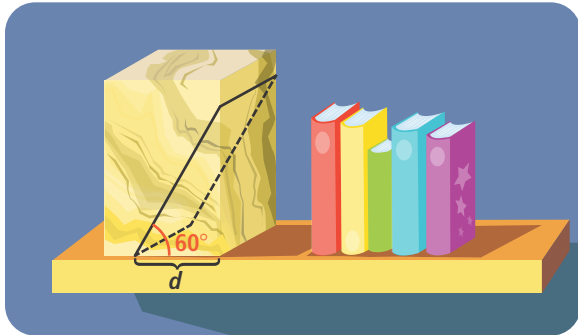


22. What is QS ? SEE EXAMPLE 5

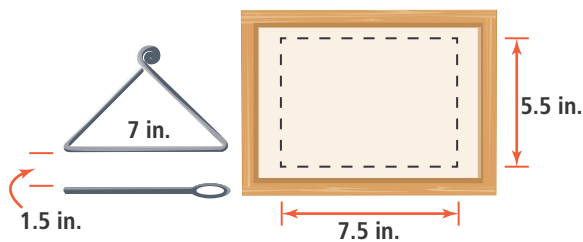


APPLY

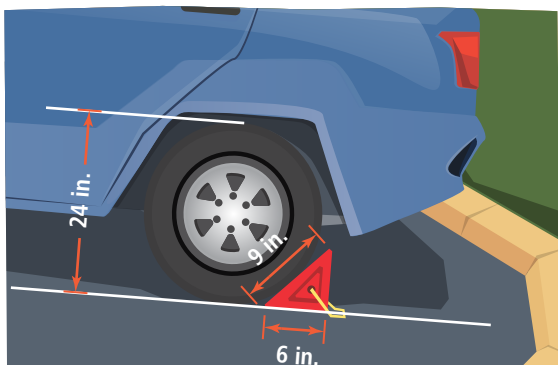
23. **Reason** Esteban wants marble bookends cut at a 60° angle, as shown. If Esteban wants his bookends to be between 7.5 in. and 8 in. tall, what length d should the marble cutter make the base of the bookends? Explain.



24. **Communicate Precisely** Sarah finds an antique dinner bell that appears to be in the shape of an isosceles right triangle, but the only measurement given is the longest side. Sarah wants to display the bell and wand in a 5.5-in. by 7.5-in. picture frame. Assuming that the bell is an isosceles right triangle, can Sarah display the bell and wand within the frame? Explain.



25. **Construct Arguments** When Carmen parks on a hill, she places chocks behind the wheels of her car. The height of the chocks must be at least one-fourth of the height of the wheels to hold the car securely in place. The chock shown has the shape of a right triangle. Is it safe for Carmen to use? Explain.

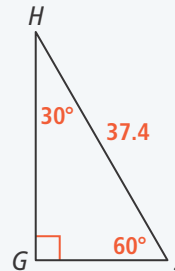


ASSESSMENT PRACTICE

26. Match each set of triangle side lengths with the best description of the triangle.

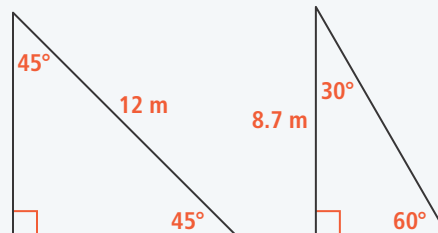
- | | |
|-----------------------------------|--|
| I. $\sqrt{2}, \sqrt{2}, \sqrt{3}$ | A. right triangle |
| II. $5, 3\sqrt{2}, \sqrt{43}$ | B. 30° - 60° - 90° triangle |
| III. $8, 8, 8\sqrt{2}$ | C. 45° - 45° - 90° triangle |
| IV. $11, 11\sqrt{3}, 22$ | D. not a right triangle |

27. **SAT/ACT** What is GJ ?



- | | |
|--------------------|--------------------|
| (A) 18.7 | (C) $18.7\sqrt{3}$ |
| (B) $18.7\sqrt{2}$ | (D) 74.8 |

28. **Performance Task** Emma designed two triangular sails for a boat.



Part A What is the area of Sail A?

Part B What is the area of Sail B?

Part C Is it possible for Emma to cut both sails from one square of sailcloth with sides that are 9 meters in length? Draw a diagram to explain.