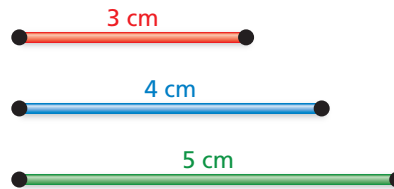


EXAMPLE 1 Constructing a Triangle with Given Side Lengths

Construct a triangle with side lengths of 3 centimeters, 4 centimeters, and 5 centimeters.

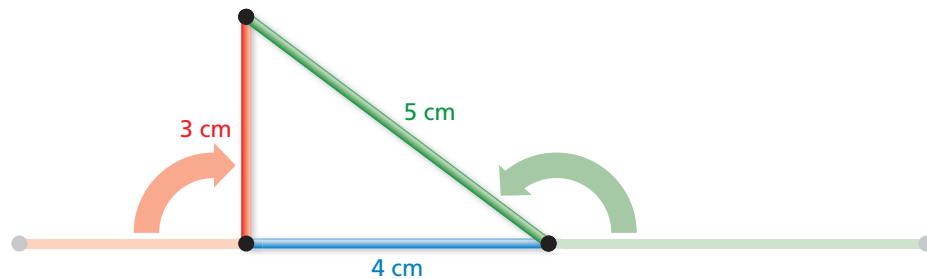
Step 1: Cut different colored straws to the appropriate lengths.



Step 2: Arrange the straws side by side.



Step 3: Form the triangle by connecting the ends of the red and green straws.



Practice

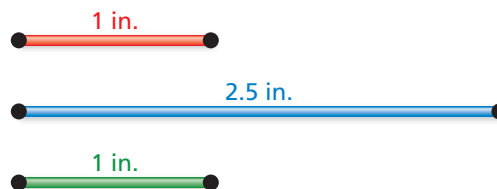
Construct a triangle with the given side lengths.

- 6 cm, 5 cm, 3 cm
- 5 cm, 12 cm, 13 cm
- 2 in., 3 in., 2 in.
- REASONING** Repeat Exercises 1–3, but place the sides in a different order when arranging them side by side.
 - Did you construct any triangles that look different from the original triangles? Do the triangles have the same shape and size?
 - Given three side lengths that form a triangle, how many different triangles do you think you can construct? Explain.

EXAMPLE 2 Constructing a Triangle with Given Side Lengths

Construct a triangle with side lengths of 1 inch, 2.5 inches, and 1 inch, if possible.

Step 1: Cut different colored straws to the appropriate lengths.



Step 2: Arrange the straws side by side.



Step 3: The red and green straws are not long enough for their ends to connect. So, a triangle cannot be constructed.



Practice

Construct a triangle with the given side lengths, if possible.

- 2 cm, 4 cm, 1 cm
 - 6 cm, 8 cm, 10 cm
 - 1 in., 2 in., 1 in.
 - 5 cm, 7 cm, 4 cm
 - 2 in., 2 in., 2 in.
 - 1 in., 5 in., 3 in.
11. **REASONING** Complete the table below for each set of side lengths in Exercises 5–10. Write a rule that compares the sum of any two side lengths to the third side length.

Side Length			
Sum of Other Two Side Lengths			

The sum of the angle measures of any triangle is 180° . You can use a protractor to construct a triangle given three angle measures.

EXAMPLE 3 Constructing a Triangle with Given Angle Measures

Construct a triangle with the given angle measures, if possible.

a. $35^\circ, 25^\circ, 100^\circ$

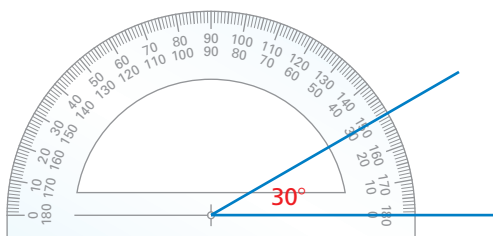
The sum of the angle measures is $35^\circ + 25^\circ + 100^\circ = 160^\circ$.

❖ The sum of the angle measures is not 180° . So, you cannot construct a triangle with these angle measures.

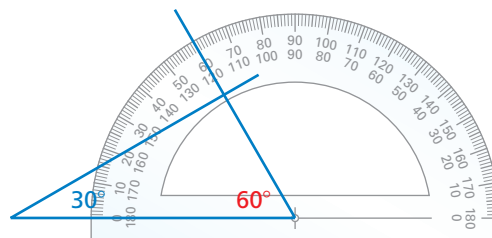
b. $30^\circ, 60^\circ, 90^\circ$

The sum of the angle measures is $30^\circ + 60^\circ + 90^\circ = 180^\circ$. Use a protractor to construct a triangle with these angle measures.

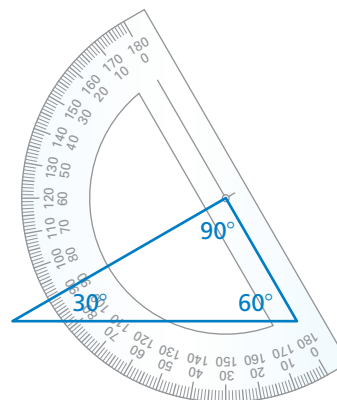
Step 1: Use a protractor to draw the 30° angle.



Step 2: Use a protractor to draw the 60° angle.



Step 3: The protractor shows that the measure of the remaining angle is 90° .



Practice

Construct a triangle with the given angle measures, if possible.

12. $50^\circ, 30^\circ, 110^\circ$

13. $60^\circ, 60^\circ, 60^\circ$

14. $60^\circ, 40^\circ, 80^\circ$

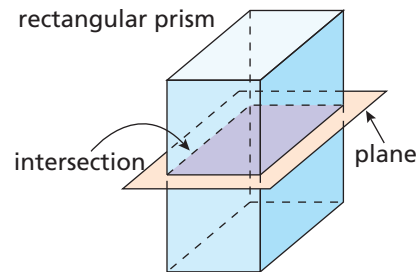
15. $45^\circ, 75^\circ, 100^\circ$

16. $20^\circ, 20^\circ, 120^\circ$

17. $70^\circ, 70^\circ, 40^\circ$

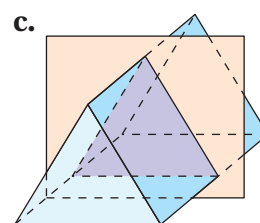
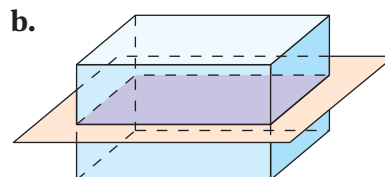
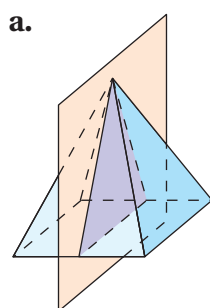
18. **REASONING** Construct a triangle with angle measures $90^\circ, 45^\circ,$ and 45° . Could you have drawn the sides longer? How many triangles can you construct given three angle measures whose sum is 180° ?

Consider a plane “slicing” through a solid. The intersection of the plane and the solid is a two-dimensional shape. For example, the diagram shows that the intersection of the plane and the rectangular prism is a rectangle.



EXAMPLE 4 Describing the Intersection of a Plane and a Solid

Describe the intersection of the plane and the solid.

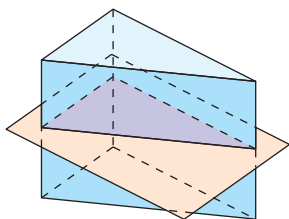


- a. The intersection is a triangle.
- b. The intersection is a rectangle.
- c. The intersection is a triangle.

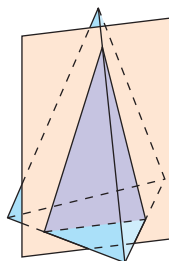
Practice

Describe the intersection of the plane and the solid.

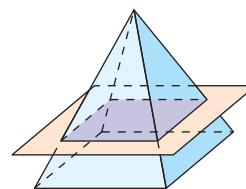
19.



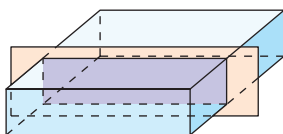
20.



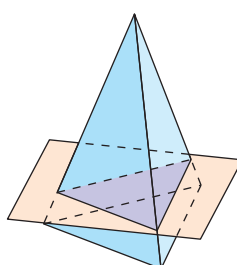
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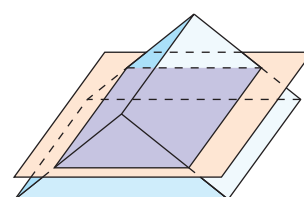
22.



23.



24.



25. **REASONING** A plane that intersects a prism is parallel to the bases of the prism. Describe the intersection of the plane and the prism.