Constructing Triangles Worksheet

Grade 7 · Common Core 7.G.A.2

> Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

Practice

Builds the skill step by step.

1. Can side lengths of 3 cm, 4 cm and 8 cm form a triangle?

   A. Yes, because 3 + 4 + 8 = 15.

   B. Yes, any three lengths make a triangle.

   C. No, because 8 is even.

   D. No, because 3 + 4 is less than 8.

2. Two angles of a triangle measure 50° and 60°. What is the third angle?

3. Which set of side lengths can form a triangle?

   A. 2, 3, 6

   B. 5, 6, 10

   C. 4, 4, 9

   D. 1, 2, 3

4. A triangle has angles of 90° and 35°. What is the third angle?

5. Which set of angle measures can form a triangle?

   A. 50°, 60°, 80°

   B. 90°, 90°, 10°

   C. 30°, 30°, 30°

   D. 40°, 60°, 80°

6. Two sides of a triangle are 5 cm and 9 cm. What is the shortest whole-number length the third side can have?

7. Two sides of a triangle are 5 cm and 9 cm. What is the longest whole-number length the third side can have?

8. How many different triangles have angles of 30°, 60° and 90°?

   A. More than one, because they can be different sizes

   B. Exactly one

   C. None

   D. Exactly two

9. How many different triangles have sides of 5 cm, 12 cm and 13 cm?

   A. More than one

   B. None

   C. Exactly two

   D. Exactly one

10. An isosceles triangle has a vertex angle of 40°. What is each base angle?

ALBERT

Name _____ Date _____

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On Level

Grade-level practice.

1. How many triangles have angles of 70°, 70° and 50°?

   A. Exactly one

   B. More than one

   C. Exactly two

   D. None

2. A triangle has sides of 7 in and 12 in. Write an inequality for the possible lengths x of the third side.

3. Which information determines exactly one triangle?

   A. Angles of 40°, 60° and 80°

   B. Sides of 4 cm and 6 cm only

   C. One 90° angle only

   D. Sides of 4 cm and 6 cm with a 50° angle between them

4. An isosceles triangle has two sides of 8 cm and a perimeter of 26 cm. How long is the third side?

5. In a triangle, one angle is twice another, and the third angle is 60°. What are the other two angles?

6. Can a triangle have two right angles?

   A. No, because the angles would add to more than 180°

   B. Yes, if the third angle is 0°

   C. Yes, if the triangle is very large

   D. No, because right angles must face each other

7. A triangle has sides x, x + 2 and 10. Its perimeter is 30. What is x?

8. Which side lengths form a triangle?

   A. 6, 8, 14

   B. 6, 8, 15

   C. 6, 8, 2

   D. 6, 8, 13

9. A triangle's angles are in the ratio 2 : 3 : 4. What is the largest angle?

10. An equilateral triangle has a perimeter of 27 cm. How many different triangles fit this description?

    A. More than one

    B. None

    C. Exactly three

    D. Exactly one

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Challenge

Multi-step and word problems that stretch it.

1. Two sides of a triangle are 4.5 m and 7 m. The third side is a whole number of meters. How many different lengths are possible?

2. Which conditions give more than one triangle?

   A. Sides of 3 cm, 4 cm and 5 cm

   B. Sides of 5 cm and 7 cm with a 60° angle between them

   C. Angles of 50° and 60° with a 6 cm side between them

   D. Angles of 45°, 45° and 90°

3. The angles of a triangle are $x°$, $(2x + 10)°$ and $(3x - 4)°$. Find each angle.

4. A triangle has angles of 36° and 72°. Find the third angle. Is the triangle isosceles?

5. Maya tries to make a triangle with sides of 2 cm, 3 cm and 5 cm. What happens?

   A. The sides lie flat on a line, so no triangle forms.

   B. A triangle with a 180° angle forms.

   C. A right triangle forms.

   D. An isosceles triangle forms.

6. A triangle has a perimeter of 40 cm. One side is 15 cm, and the other two sides are equal. How long is each of them?

7. An isosceles triangle has one angle of 100°. What are the other two angles?

8. Two sides of 6 cm with a 60° angle between them determine which triangle?

   A. Exactly one equilateral triangle

   B. More than one triangle

   C. No triangle

   D. Exactly one right triangle

9. A triangle has sides of 9, 12 and x. If x is a whole number, what is the greatest value x can have?

10. Leo has straws of 3, 5, 7 and 9 inches. How many different triangles can he make using three straws at a time?