

# Reasoning and Problem Solving

## Step 5: Angles in a Triangle 1

### National Curriculum Objectives:

Mathematics Year 6: (6G3a) [Draw 2-D shapes using given dimensions and angles](#)

Mathematics Year 6: (6G2a) [Compare and classify geometric shapes based on their properties and sizes](#)

Mathematics Year 6: (6G4a) [Find unknown angles in any triangles, quadrilaterals, and regular polygons](#)

### Differentiation:

Questions 1, 4 and 7 (Problem Solving)

**Developing** Use simple clues and a given starting length to draw a right or equilateral triangle.

**Expected** Use clues and a given starting length to draw a right, equilateral, isosceles or scalene triangle.

**Greater Depth** Use clues to draw a right, equilateral, isosceles or scalene triangle without a starting length.

Questions 2, 5 and 8 (Problem Solving)

**Developing** Match three descriptions to three triangles (by identifying the different triangle types by their properties).

**Expected** Match three descriptions to three triangles (where one angle is missing in every triangle). Angles given in multiples of 5.

**Greater Depth** Match four descriptions to four triangles (where two angles are missing in every triangle). Angles given in one degree increments.

Questions 3, 6 and 9 (Reasoning)

**Developing** Determine whether a simple statement about an isosceles, scalene or equilateral triangle is correct based on facts known about each triangle's sides.

**Expected** Determine whether a statement about an isosceles, scalene or equilateral triangle is correct based on facts known about each triangle's angles. Angles given in multiples of 5.

**Greater Depth** Determine whether a statement about an obtuse, right or acute isosceles, scalene, or equilateral triangle is correct. Angles given in one degree increments.

More [Year 6 Properties of Shapes](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

## Angles in a Triangle 1

1a. Use these clues to draw a triangle.

- The triangle has three sides that are each 5cm long.
- Angles A, B and C are equal to each other.

What kind of triangle have you drawn?



PS

## Angles in a Triangle 1

1b. Use these clues to draw a triangle.

- Two sides of the triangle are each 3cm long.
- One angle is 90 degrees.
- Two angles are 45 degrees each.

What kind of triangle have you drawn?



PS

2a. Match each triangle to the best description.

- This triangle has one obtuse angle.
- This triangle has three equal sides and three equal angles.
- This triangle has three acute angles.

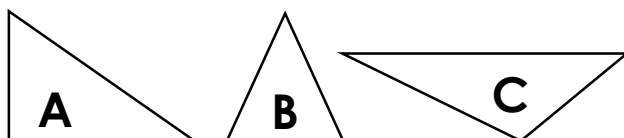


*Triangles not drawn to scale.*

PS

2b. Match each triangle to the best description.

- This triangle has a right angle.
- This triangle has one angle that is greater than 90 degrees.
- This triangle is an isosceles triangle.



*Triangles not drawn to scale.*

PS

3a. Theodora says,

I have drawn an equilateral triangle. One side is 10 centimetres long and the other two sides are each 9 centimetres long.

Is she correct? Explain why or why not.



R

3b. Kenneth says,

I have drawn a scalene triangle. All the sides are different lengths and one of the angles is a right angle.

Is he correct? Explain why or why not.



R

## Angles in a Triangle 1

4a. Use these clues to draw a triangle.

- The triangle has a base of 4cm.
- Angle A is  $50^\circ$ .
- Angles B and C are the same.

What kind of triangle have you drawn?



PS

## Angles in a Triangle 1

4b. Use these clues to draw a triangle.

- The triangle has a base of 3cm.
- Angle A is  $80^\circ$ .
- Angle B is half the size of Angle A.

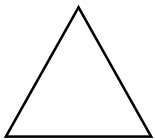
What kind of triangle have you drawn?



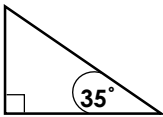
PS

5a. Match each triangle to the best description.

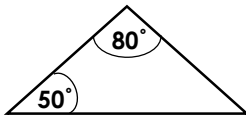
- The missing angle in this triangle is  $50^\circ$ .
- The missing angle in this triangle is a multiple of 5.
- This triangle has three  $60^\circ$  angles.



A



B



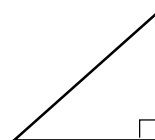
C

Triangles not drawn to scale.

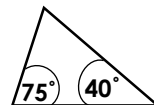
PS

5b. Match each triangle to the best description.

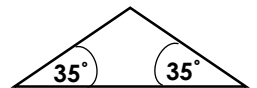
- The two missing angles in this triangle equal  $90^\circ$ .
- The missing angle in this triangle is obtuse.
- This triangle has no equal angles.



A



B



C

Triangles not drawn to scale.

PS

6a. Javier says,

I have drawn an isosceles triangle. One side is 10 centimetres long and the angles measure  $35^\circ$ ,  $45^\circ$  and  $100^\circ$ .

Is he correct? Explain why or why not.



R

6b. Winona says,

I have drawn an equilateral triangle. All the sides are the same length and all the angles are obtuse.

Is she correct? Explain why or why not.



R

## Angles in a Triangle 1

## Angles in a Triangle 1

7a. Use these clues to draw a triangle.

- The triangle has two sides of equal lengths.
- Angle C is  $56^\circ$ .
- Angles A and B are the same.

What kind of triangle have you drawn?



PS

7b. Use these clues to draw a triangle.

- The triangle has no equal sides.
- Angle A is  $120^\circ$ .
- Angle B is 5 times as big as Angle C.

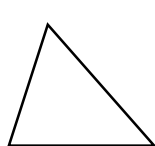
What kind of triangle have you drawn?



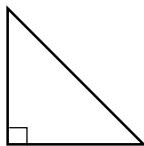
PS

8a. Match each triangle to the best description.

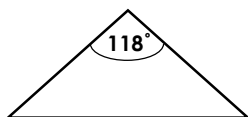
- The missing angles in this triangle add to make  $90^\circ$ .
- This obtuse isosceles triangle is missing two  $31^\circ$  angles.
- This triangle has no angles greater than  $90^\circ$ .



A



B



C

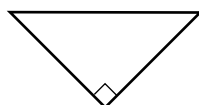


Triangles not drawn to scale.

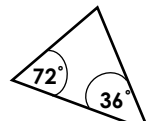
PS

8b. Match each triangle to the best description.

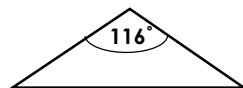
- This triangle's missing angle is twice as big as its smallest marked angle.
- This triangle has one angle that is neither acute nor obtuse.
- This triangle is missing two equal acute angles.



A



B



C



Triangles not drawn to scale.

PS

9a. Alfie says,

I have drawn a scalene triangle. One side is 4 centimetres long and the angles measure  $47^\circ$ ,  $63^\circ$  and  $69^\circ$ .

Is he correct? Explain why or why not.



R

9b. Kiera says,

I have drawn an isosceles triangle. All the sides are multiples of 2 and the angles are  $46^\circ$ ,  $23^\circ$  and  $111^\circ$ .

Is she correct? Explain why or why not.

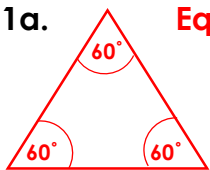


R

## Varied Fluency Angles in a Triangle 1

### Developing

1a. **Equilateral triangle**

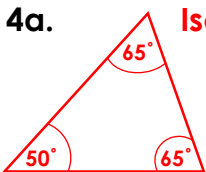


2a. 1C, 2A, 3B

3a. Theodora is incorrect. All three sides of an equilateral triangle must be equal. She has drawn an isosceles triangle.

### Expected

4a. **Isosceles triangle**

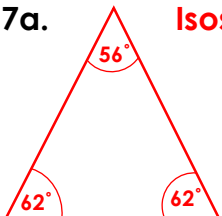


5a. 1C, 2B, 3A

6a. Javier is incorrect. He has drawn a scalene triangle.

### Greater Depth

7a. **Isosceles triangle**



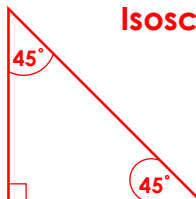
8a. 1B, 2C, 3A

9a. Alfie is incorrect. His angles only total 179 degrees, not 180 degrees.

## Varied Fluency Angles in a Triangle 1

### Developing

1b. **Isosceles triangle**

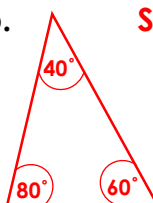


2b. 1A, 2C, 3B

3b. Kenneth is correct, a right-angled triangle can be scalene as long as all the sides are different lengths.

### Expected

4b. **Scalene triangle**

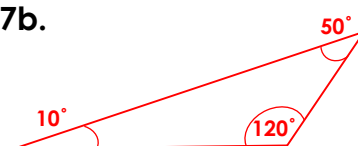


5b. 1A, 2C, 3B

6b. Winona is incorrect. The angles in a triangle cannot all be obtuse.

### Greater Depth

7b. **Scalene triangle**



8b. 1B, 2A, 3C

9b. She is incorrect. Two sides and two angles must be equal in an isosceles triangle. She has drawn a scalene triangle.