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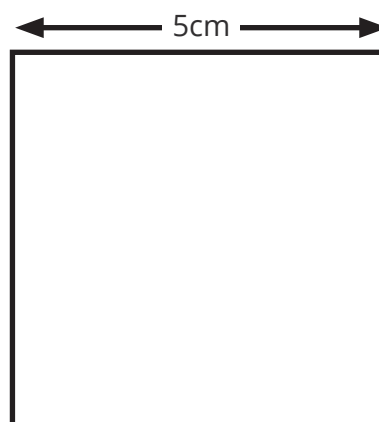- Adobe Reader is a free PDF viewer, from Adobe. To install a copy of Adobe Reader, go to https://get.adobe.com/uk/reader/.
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← 5cm →

Constructing Triangles – Investigation **Answers**

Below are seven sticks, each with a different length.

Drawn to scale

10cm ——————————————————————

8cm ————————————————————

3cm ——————

5cm ——————————

7cm ——————————————

4cm ————————

9cm ——————————————————
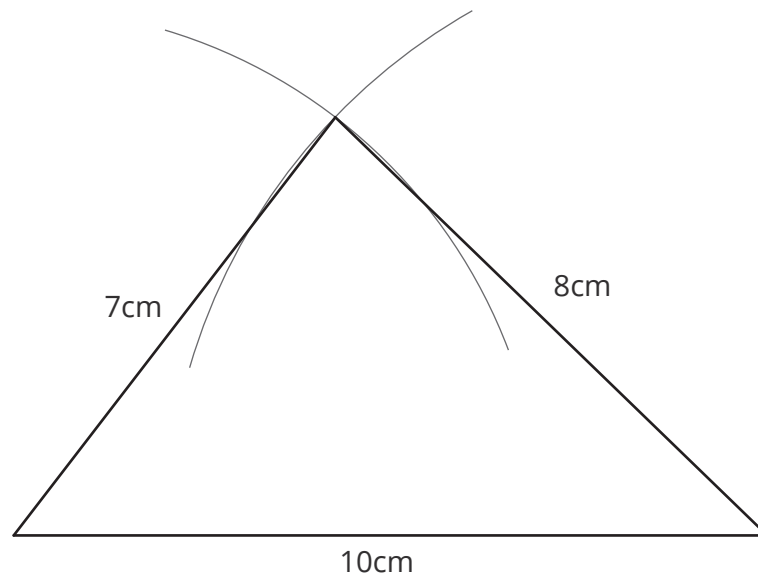
1. Use a pair of compasses, ruler and pencil to construct triangles with the following lengths of sides. Which triangles are impossible to construct?
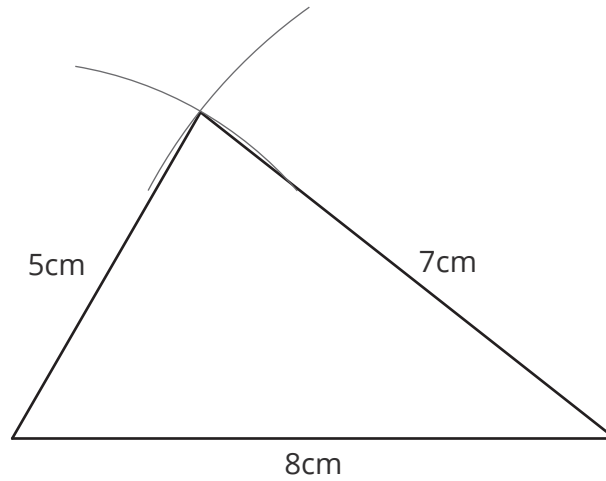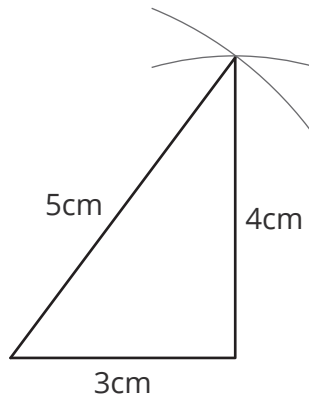
   a. 10cm, 7cm, 8cm

   Possible

7cm   *8cm*

10cm

b. 8cm, 5cm, 7cm

Possible

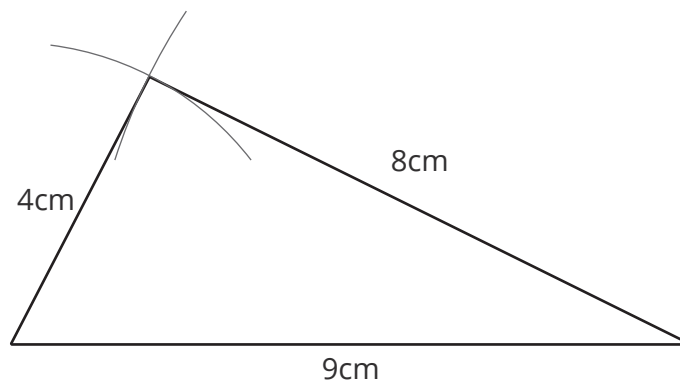
c. 3cm, 5cm, 4cm

Possible

d. 10cm, 3cm, 7cm

Impossible

e. 5cm, 8cm, 2cm

Impossible

f. 9cm, 4cm, 8cm

Possible

2. Explain how you can find out if a triangle is impossible to construct without having to draw it.

If you take the length of two of the sides of a triangle, their sum must be greater than the length of the third side. For a triangle to be possible, this must be the case for all three combinations of sides. For example:

A triangle with side lengths of 3cm, 4cm, 5cm:

3 + 4 > 5

3 + 5 > 4

4 + 5 > 3

Therefore, this triangle is possible.

A triangle with side lengths of 2cm, 4cm, 7cm:

2 + 4 < 7

2 + 7 > 4

7 + 4 > 2

For one of these combinations, the sum of the lengths of two sides is not greater than the length of the third side (2 + 4 < 7), therefore this triangle is impossible to construct.

3. **Without** drawing them, which of the following triangles are **impossible** to construct.

   a. 8cm, 10cm, 6cm

   Possible

   b. 5cm, 12cm, 13cm

   Possible

   c. 3m, 8m, 4m,

   Impossible

   d. 10mm, 10mm, 1cm

   Possible

   e. 10mm, 3cm, 12cm

   Impossible

   f. 1cm, 3cm, 13cm

   Impossible

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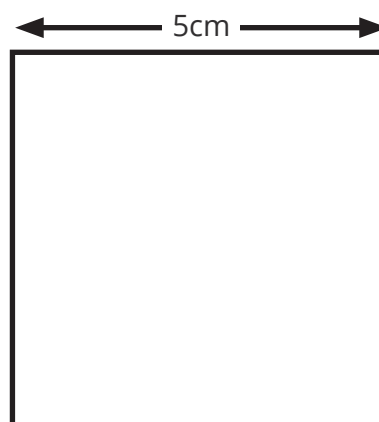**To do this, follow the relevant steps below.**

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5cm

Constructing Triangles – Investigation

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9cm ——————————————————

1. Use a pair of compasses, ruler and pencil to construct triangles with the following lengths of sides. Which triangles are impossible to construct?

a. 10cm, 7cm, 8cm

b.   8cm, 5cm, 7cm

c.   3cm, 5cm, 4cm

d. 10cm, 3cm, 7cm

e. 5cm, 8cm, 2cm

f. 9cm, 4cm, 8cm

2. Explain how you can find out if a triangle is impossible to construct without having to draw it.

_____

_____

_____

_____

_____

3. **Without** drawing them, which of the following triangles are **impossible** to construct.

a. 8cm, 10cm, 6cm

_____

b. 5cm, 12cm, 13cm

_____

c. 3m, 8m, 4m,

_____

d. 10mm, 10mm, 1cm

_____

e. 10mm, 3cm, 12cm

_____

f. 1cm, 3cm, 13cm

_____

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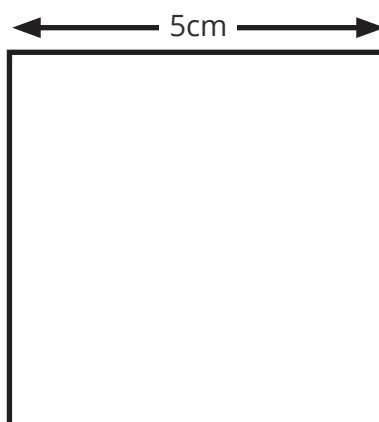**To do this, follow the relevant steps below.**

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◄──── 5cm ────►

Constructing Triangles – Investigation

Below are seven sticks, each with a different length.   ***Drawn to scale***

10cm ─────────────────────────

8cm ──────────────────────

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9cm ────────────────────────

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2. Explain how you can find out if a triangle is impossible to construct without having to draw it.

3. **Without** drawing them, which of the following triangles are **impossible** to construct.

   a. 8cm, 10cm, 6cm   c. 3m, 8m, 4m,   e. 10mm, 3cm, 12cm

   b. 5cm, 12cm, 13cm   d. 10mm, 10mm, 1cm   f. 1cm, 3cm, 13cm