# Similar Shapes

## Materials required for examination
- Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
- Tracing paper may be used.

## Items included with question papers
- Nil

## Instructions
- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page with your name, centre number and candidate number.
- Answer all questions.
- Answer the questions in the spaces provided – there may be more space than you need.
- Calculators may be used.

## Information
- The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.
- Questions labelled with an asterisk (*) are ones where the quality of your written communication will be assessed – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

## Advice
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.
1. Shapes $ABCD$ and $EFGH$ are mathematically similar.

![Diagram of shapes ABCD and EFGH](image)

Diagrams NOT accurately drawn

(a) Calculate the length of $BC$.

\[ \text{................................... cm} \]  

(2)

(b) Calculate the length of $EF$.

\[ \text{................................... cm} \]  

(2)

(Total 4 marks)
Triangles $ABC$ and $PQR$ are mathematically similar.

Angle $A = angle P$.
Angle $B = angle Q$.
Angle $C = angle R$.
$AC = 4$ cm.
$BC = 12$ cm.
$PR = 6$ cm.
$PQ = 15$ cm.

(a) Work out the length of $QR$.

\[ \text{..........cm} \quad (2) \]

(b) Work out the length of $AB$.

\[ \text{..........cm} \quad (2) \]

(Total 4 marks)
Triangles $ABC$ and $DEF$ are similar.

$AB = 4$ cm.
$AC = 9$ cm.
$DE = 6$ cm.
$EF = 10.5$ cm.

(a) Work out the length of $DF$.

(b) Work out the length of $BC$.

(Total 4 marks)
The diagram shows two similar triangles.

In triangle $ABC$, $AB = 10$ cm and $AC = 18$ cm.
In triangle $PQR$, $PQ = 6$ cm and $QR = 12$ cm.

Angle $ABC = \angle PQR$.
Angle $CAB = \angle RPQ$.

(a) Calculate the length of $BC$.

(b) Calculate the length of $PR$. 

(Total 4 marks)
Triangle $ABC$ is similar to triangle $ADE$.
$AC = 15$ cm.
$CE = 6$ cm.
$BC = 12.5$ cm.

Work out the length of $DE$.

.................................. cm

(Total 3 marks)
A 20 Euro note is a rectangle 133 mm long and 72 mm wide.
A 500 Euro Note is a rectangle 165 mm long and 82 mm wide.
Show that the two rectangles are not mathematically similar.
7. The diagram shows two similar solids, A and B.

Solid A has a volume of 80 cm$^3$.

(a) Work out the volume of solid B.

....................................cm$^3$

(2)

Solid B has a total surface area of 160 cm$^2$.

(b) Work out the total surface area of solid A.

....................................cm$^2$

(2)

(Total 4 marks)