Cambridge Assessment International Education

# Cambridge IGCSE™

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CANDIDATE NAME | | | | | | | | | |
| CENTRE NUMBER | | | | | | CANDIDATE NUMBER | | | | |

*1893755370*

**CAMBRIDGE INTERNATIONAL MATHEMATICS** **0607/53**

Paper 5 Investigation (Core) **October/November 2020**

**1 hour 10 minutes**

You must answer on the question paper.

No additional materials are needed.

**INSTRUCTIONS**

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a graphic display calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly, including sketches, to gain full marks for correct methods.
- In this paper you will be awarded marks for providing full reasons, examples and steps in your working to communicate your mathematics clearly and precisely.

**INFORMATION**

- The total mark for this paper is 36.
- The number of marks for each question or part question is shown in brackets [ ].

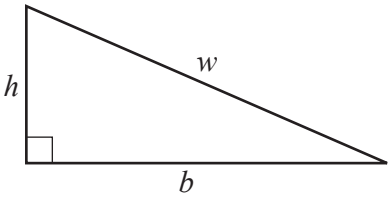
This document has **8** pages. Blank pages are indicated.

Answer **all** the questions.

**INVESTIGATION AREA OF RIGHT-ANGLED TRIANGLES**

This investigation looks at finding the area of a right-angled triangle using its perimeter.

In this investigation all lengths are in centimetres.

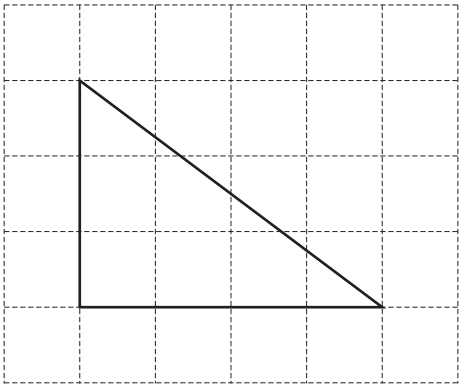



$w$ is the hypotenuse of the triangle,
$b$ is the base of the triangle,
$h$ is the height of the triangle.

Perimeter, $P$, of this triangle. $P = b + h + w$

Area, $A$, of this triangle. $A = \frac{1}{2}bh$

**1 (a)**



This right-angled triangle is drawn on a 1 $cm^2$ grid.

**(i)** Measure and write down the length of the hypotenuse.

..... [1]

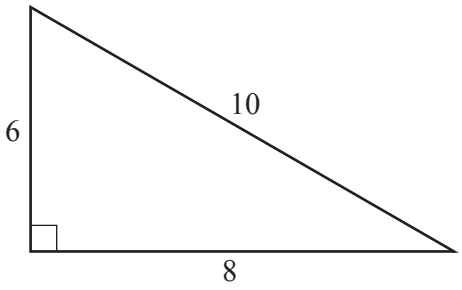
**(ii)** Show that the perimeter is 12.

[1]

**(iii)** Find the area of the triangle.

..... [1]

**(b)**




NOT TO SCALE

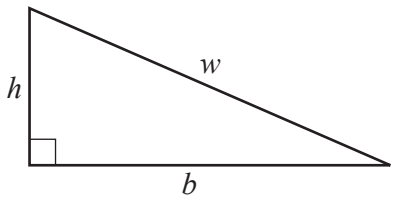
**(i)** Find the perimeter of this triangle.

..... [2]

**(ii)** Find the area of this triangle.

..... [2]

**(c)**



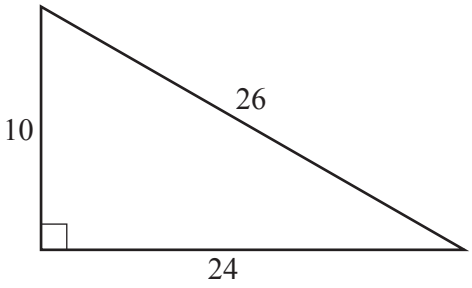

NOT TO SCALE

Complete the table for right-angled triangles with sides $b$, $h$ and $w$.

| $b$ | $h$ | $w$ | Perimeter, $P$ | Area, $A$ |
|---|---|---|---|---|
| 12 | 5 | 13 | 30 | 30 |
| 84 | 13 | 85 | | |
| 24 | | 25 | 56 | 84 |
| 60 | 11 | | 132 | |

[5]

**2 (a)**



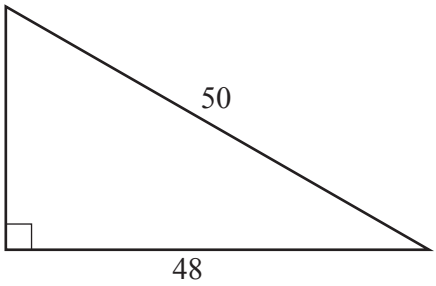

NOT TO SCALE

This triangle has perimeter $P = 60$.

Show that the calculation $\frac{60}{2} \times \left(\frac{60}{2} - 26\right)$ gives the correct area for this triangle.

[3]

**(b)**




NOT TO SCALE

This triangle has perimeter $P = 112$.

Show that the calculation $\frac{112}{2} \times \left(\frac{112}{2} - 50\right)$ gives the correct area for this triangle.

[3]

**3** **(a)** Complete the table.

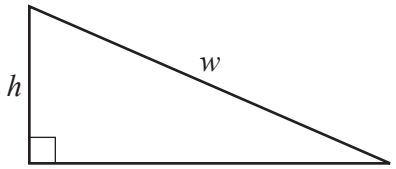
| $b$ | $h$ | $w$ | $P$ | $A$ | Calculation |
|---|---|---|---|---|---|
| 24 | 10 | 26 | 60 | 120 | $\frac{60}{2}\times\left(\frac{60}{2}-26\right)$ = 120 |
| 12 | 9 | 15 | 36 | 54 | $\frac{36}{2}\times\left(\frac{36}{2}-15\right)$ = 54 |
| 48 | | 50 | 112 | | $\frac{112}{2}\times\left(\frac{112}{2}-50\right)$ = |
| 15 | 8 | 17 | | 60 | = 60 |
| 21 | | 29 | 70 | 210 | = |
| | 12 | 37 | | 210 | = |

[8]

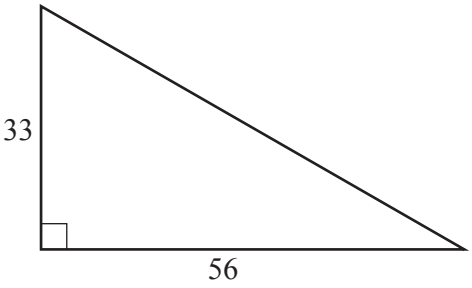
**(b)** Write an expression for the area of a right-angled triangle in terms of $P$ and $w$.

..... [1]

**(c)**




Pythagoras' Theorem
$w^2 = b^2 + h^2$



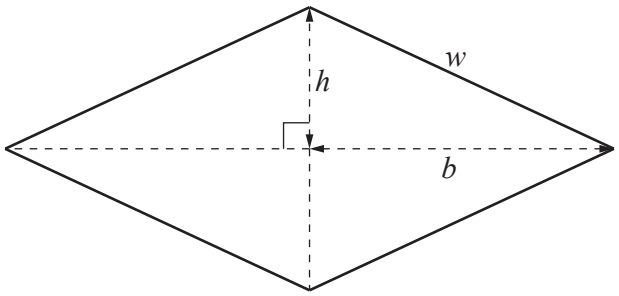

NOT TO SCALE

Use your expression from **part (b)** to find the area of this triangle.

..... [4]

**Question 4 is printed on the next page.**

**4 (a)**




NOT TO SCALE

This is a rhombus.

Use **Question 3(b)** to write down an expression for the area of this rhombus in terms of $P$ and $w$.

..... [1]

**(b)** Use your expression from **part (a)** to find the area of this rhombus when $w = 41$ and $b = 40$.

..... [4]