Cambridge Assessment International Education

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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.

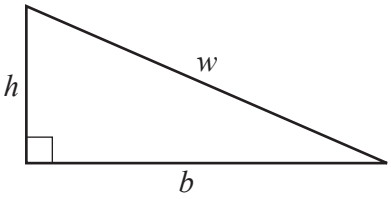
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Answer **all** the questions.

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.

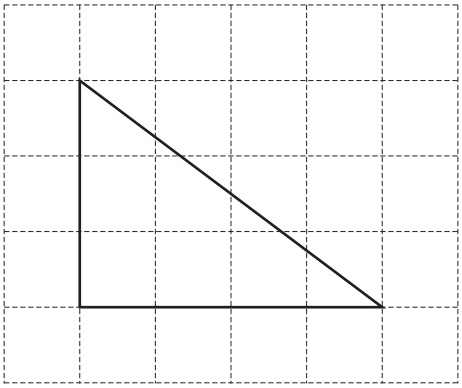


w is the hypotenuse of the triangle,
b is the base of the triangle,
h is the height of the triangle.

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.

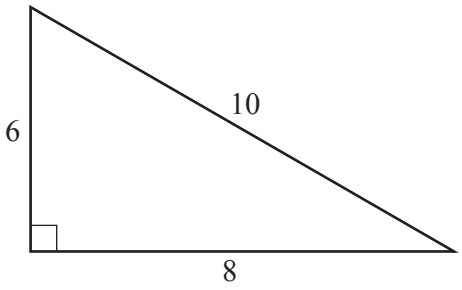
[1]

(iii) Find the area of the triangle.

..... [1]

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(b)



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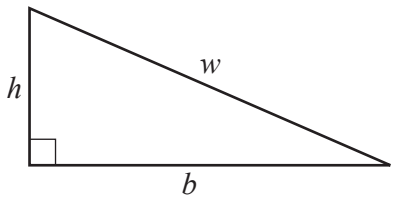
(i) Find the perimeter of this triangle.

..... [2]

(ii) Find the area of this triangle.

..... [2]

(c)



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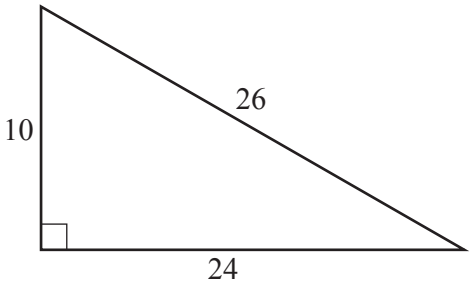
Complete the table for right-angled triangles with sides b, h and w.

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

[5]

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2 (a)



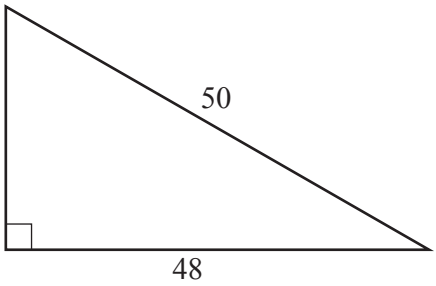
NOT TO SCALE

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	=

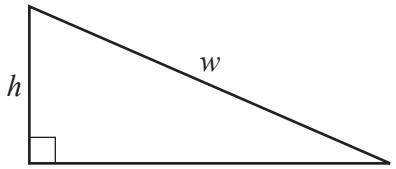
[8]

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

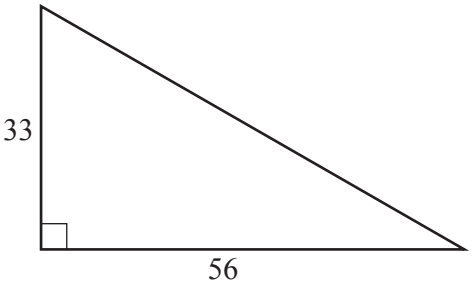
..... [1]

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(c)



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



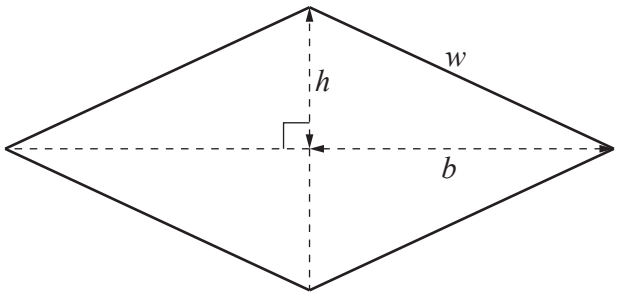
NOT TO SCALE

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]

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