Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

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Pythagoras' theorem

Time allowed: 50 minutes

Subject code **0580**

Mathematics

Questions from Paper 1, Paper 2 and Paper 3

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.
You may use a calculator.

Total marks

/ 41

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.
- Unless a question says otherwise, give answers that are not exact to 3 significant figures, and angles in degrees to 1 decimal place.

Information

- This paper has 10 questions worth 41 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

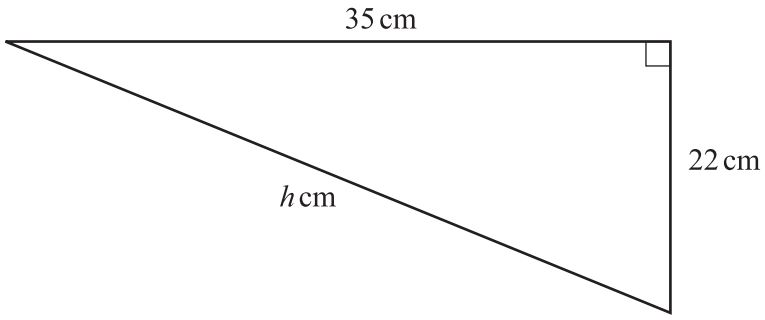
Advice

- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

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Print at 100% (Actual size) so diagrams keep their real measurements.

1 The diagram shows a right-angled triangle.



NOT TO SCALE

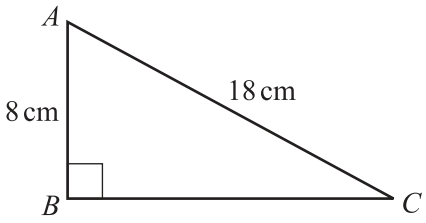
Calculate the value of h.

$h =$ ..... [2]

Pythagoras' theorem Click for more variations

1	41.3 or 41.34…	**2**	**M1** for $35^2 + 22^2$ oe or better

2



NOT TO SCALE

Calculate the length of BC.

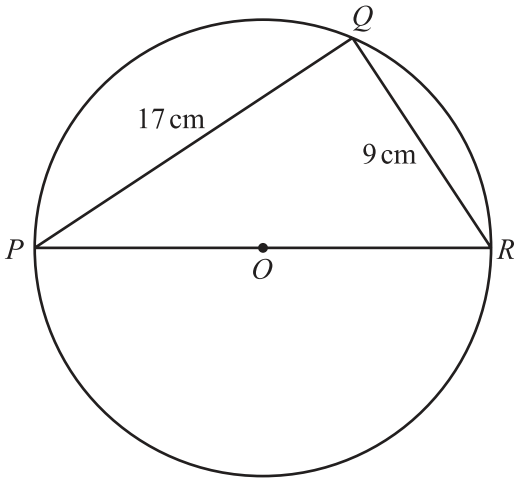
$BC =$ ..... cm [3]

Pythagoras' theorem Click for more variations

2	16.1 or 16.12 to 16.13	**3**	**M2** for $\sqrt{(18^2 - 8^2)}$ or better or **M1** for $18^2 = […]^2 + 8^2$ or better

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3



NOT TO SCALE

The diagram shows a circle, centre O.
P, Q and R are points on the circumference.
$PQ = 17$ cm and $QR = 9$ cm.

(a) Explain why angle PQR is 90°.

Answer(a) .....

..... [1]

(b) Calculate the length PR.

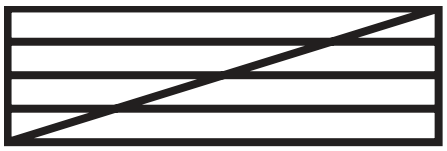
Answer(b) $PR =$ ..... cm [2]

(a) Circle theorems (b) Pythagoras' theorem Click for more variations

3	**(a)**	Angle [in a] semi-circle	**1**	
	(b)	19.2 or 19.23 to 19.24	**2**	**M1** for $17^2 + 9^2$

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4



NOT TO SCALE

The diagram represents a rectangular gate measuring 1.5m by 3.5m.
It is made from eight lengths of wood.

Calculate the total length of wood needed to make the gate.

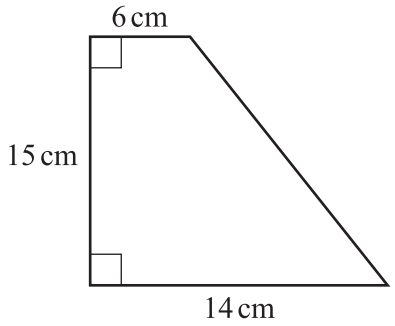
Answer ..... m [3]

Pythagoras' theorem Click for more variations

4	24.3(0788…)	3	**M1** $5 \times 3.5 + 2 \times 1.5$ **M1** $(\surd) 1.5^2 + 3.5^2$

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5



NOT TO SCALE

Calculate the perimeter of this trapezium.

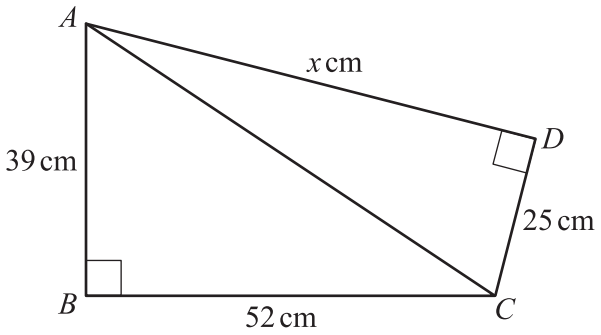
..... cm [4]

Pythagoras' theorem Click for more variations

5	52	**4**	**B3** for 17 OR **B1** for 8 correctly identified **M1** for $15^2 + (\textit{their}\ 8)^2$ oe **M1dep** for 14 + 15 + 6 + *their* 17 soi

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6



NOT TO SCALE

The diagram shows two right-angled triangles, *ABC* and *ACD*.

Work out the value of x.

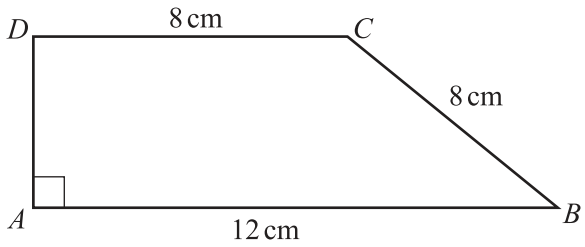
$x =$ ..... [4]

Pythagoras' theorem Click for more variations

6	60 cao	**4**	**M3** for $39^2 + 52^2 - 25^2 \left[= x^2\right]$ oe or **M2** for $39^2 + 52^2 = 25^2 + x^2$ oe or **M1** for $39^2 + 52^2$ or $25^2 + x^2$ [= *their* AC^2]

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7



NOT TO SCALE

Calculate the area of this trapezium.

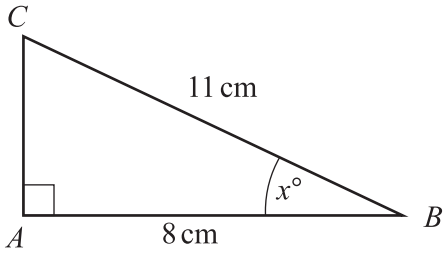
..... cm^2 [4]

Area Click for more variations

7	69.3 or 69.28…	**4**	**M2** for height = $\sqrt{8^2 - 4^2}$ or **M1** for $4^2 + h^2 = 8^2$ oe **and M1** for $\frac{1}{2}(8+12) \times$ *their* perp height oe

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8



NOT TO SCALE

The diagram shows a right-angled triangle ABC.

(a) Work out the exact length of AC.

..... cm [3]

(b) $\cos x = k$

Write down the value of k.

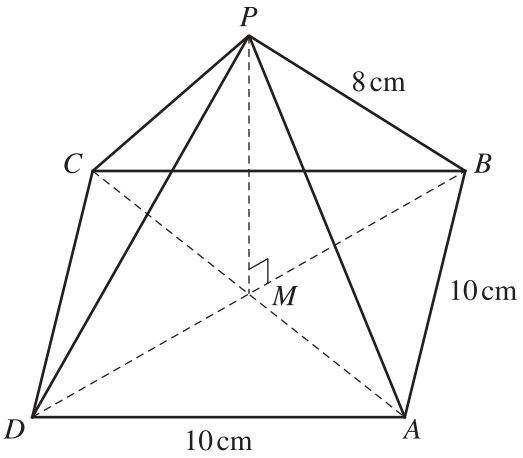
$k =$ ..... [1]

(a) Pythagoras' theorem (b) SOHCAHTOA Click for more variations

8(a)	$\sqrt{57}$	**3**	**M2** for $11^2 - 8^2$ or **M1** for $11^2 = AC^2 + 8^2$
8(b)	$\frac{8}{11}$	**1**	

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9



NOT TO SCALE

The diagram represents a pyramid with a square base of side 10 cm.

The diagonals *AC* and *BD* meet at *M*. *P* is vertically above *M* and *PB* = 8cm.

(a) Calculate the length of *BD*.

Answer(a) BD = ... cm [2]

(b) Calculate *MP*, the height of the pyramid.

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Answer(b) MP = ... cm [3]

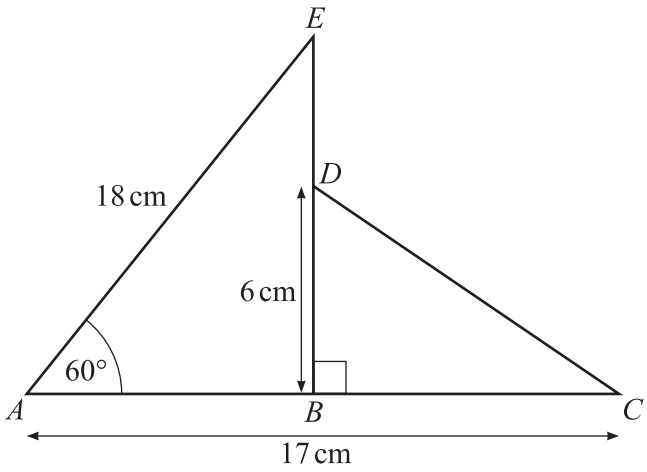
(a) Pythagoras' theorem (b) Pythagoras' theorem Click for more variations

9	**(a)** 14.1	2	**M1** $(BD^2) = 10^2 + 10^2$ or sin45 = 10/CD
	(b) 3.74 or 3.78	3	**M1 (a)**/2 **M1** (their **(a)**/2)^2 + $PM^2 = 8^2$

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10

NOT TO SCALE



The quadrilateral $ACDE$ is formed by two right-angled triangles ABE and BCD.
$AC = 17$ cm, $AE = 18$ cm and $BD = 6$ cm.

(a) Show that $CD = 10$ cm.

[5]

(b) Find the perimeter of the quadrilateral $ACDE$.
Give your answer in the form $p + k\sqrt{q}$.

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..... cm [4]

(a) Pythagoras' theorem (b) Exact trigonometric values Click for more variations

10(a)	$\frac{AB}{18} = \cos 60$ or $[AB =]\ 18\cos 60$	**M1**	
	$\cos 60 = \frac{1}{2}$ and $[AB =]\ 9$	**A1**	
	Correct use of Pythagoras' theorem i.e. $[CD^2 =]\ 6^2 + (17 - theirAB)^2$ oe	**M1**	
	Correct evaluation for *their AB* $[CD^2 =]$ 36 + 64 or $[CD =]\sqrt{36+64}$	**M1**	
	$\sqrt{100} = 10$	**A1**	Dep on M1A1M1M1
10(b)	$39 + 9\sqrt{3}$	**4**	**B3** for $[BE =]\ 9\sqrt{3}$ or for answer $k + 9\sqrt{3}$ or for answer equivalent to $39 + 9\sqrt{3}$ but not in required form OR **M2** for $\frac{BE}{18} = \frac{\sqrt{3}}{2}$ oe or better or **M1** for $\frac{BE}{18} = \sin 60$ oe or better **M1** for 18 + 17 + 10 + *their BE* − 6 oe OR **M2** for $\sqrt{18^2 - their\,9^2}$ oe or **M1** for $BE^2 + (their\ 9)^2 = 18^2$ oe **M1** for 18 + 17 + 10 + *their BE* − 6 oe

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