Name	Date started	Target end date

WJEC GCSE Mathematics and Numeracy (Double Award) — Question Pack

Foundation Pythagoras' theorem in 2-D: identifying the hypotenuse of a right-angled triangle and using $a^2 + b^2 = c^2$ to find a missing s

REVISE
.wales

F3.04 — Pythagoras' theorem in 2-D

Spec 3.7.1 — Unit 3 (calculator allowed)

Foundation Pythagoras' theorem in 2-D: identifying the hypotenuse of a right-angled triangle and using $a^2 + b^2 = c^2$ to find a missing side. Sourced from legacy WJEC GCSE Mathematics-Numeracy Foundation papers (3300U10/U20) and accessible content from Intermediate papers (3300U30/U40), organised for revision under the 2025 spec.

2025 SPECIFICATION

Estimated time for entire question pack: ~39 minutes

*Derived from the GCSE Higher pace of **~1.5 min/mark** (26 marks across 8 questions).*

*You are advised to **not** attempt to complete all of this in one sitting.*

ABOUT THIS QUESTION PACK

This is a **focused single-topic practice pack**, not a single mock paper. Questions are organised against the 2025 specification. Questions are ordered chronologically by sitting, with custom-written and SAM questions at the end.

INSTRUCTIONS

Use black ink or black ball-point pen. Show all working — method marks are awarded for clear setup.

A calculator is allowed on every question in this pack (Unit 3 is the calculator-allowed paper).

Pythagoras' theorem in 2-D — what the new spec asks

WJEC GCSE Mathematics (first teaching 2025) · Unit 3: calculator-allowed.

Pythagoras 3.6.1

- Identify the hypotenuse in any right-angled triangle.
- Use $a^2 + b^2 = c^2$ to find the hypotenuse.
- Rearrange to find a shorter side.

Applications 3.6.2

- Apply to ladders, ramps, diagonals.
- Find distance between two points on a coordinate grid.
- Decide if a triangle is right-angled by checking Pythagoras.

Calculator use 1.1.2

- Use the $\sqrt{}$ key correctly.
- Bracket the addition before square-rooting.
- Round only at the final step.

Exam strategy 3.6

- Sketch and label the triangle.
- State the formula and substitute.
- Always include units.

Crib sheet »

Pythagoras' theorem in 2-D in one page

Quick-reference notes — revisit before each question. Don't use during the questions.

The theorem

$$a^2 + b^2 = c^2$$

Only works in **right-angled triangles**. c is the hypotenuse — opposite the right angle, longest side.

Finding the hypotenuse

Square the two shorter sides, add, then square-root.

3, 4 ⇒ c = $\sqrt{(9 + 16)}$ = $\sqrt{25}$ = 5.

Finding a shorter side

Square the hypotenuse, **subtract** the other side squared, then square-root.

c = 13, b = 5 ⇒ a = $\sqrt{(169 - 25)}$ = 12.

Spotting the right angle

Look for a small square symbol in the triangle.

Without a right angle — Pythagoras doesn't apply.

Real-world Pythagoras

Ladder against a wall, ramp height, diagonal of a rectangle, distance between two points on a grid.

Common traps

- Adding instead of subtracting when finding a shorter side.
- Forgetting to square-root at the end.
- Mixing up which side is the hypotenuse.

Examiner only

11. *(a)* Calculate $\sqrt{8{\cdot}5^3 + (4{\cdot}5 - 0{\cdot}76)^2}$, correct to 3 significant figures. [2]

(b) Calculate the reciprocal of $-0{\cdot}07$, correct to 1 decimal place. [2]

12. Show that the triangle below is **not** a right-angled triangle. [5]

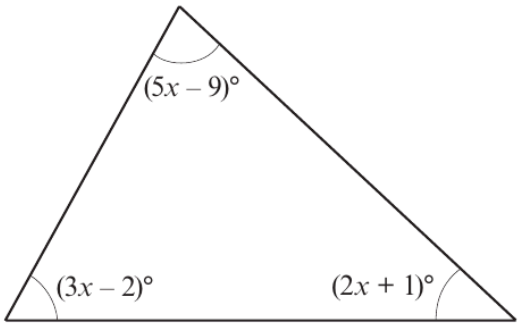

Diagram not drawn to scale

Examiner only

14. A right-angled triangle *LMN* is shown below.
LN = 16·9 cm and *LM* = 6·5 cm.

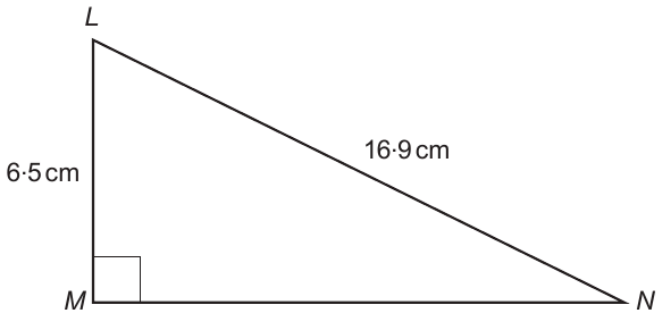

Diagram not drawn to scale

Calculate the length *MN*. [3]

Examiner only

15. *PQR* is a right-angled triangle, as shown below.
PQ = 1·41 m and *PR* = 0·89 m.

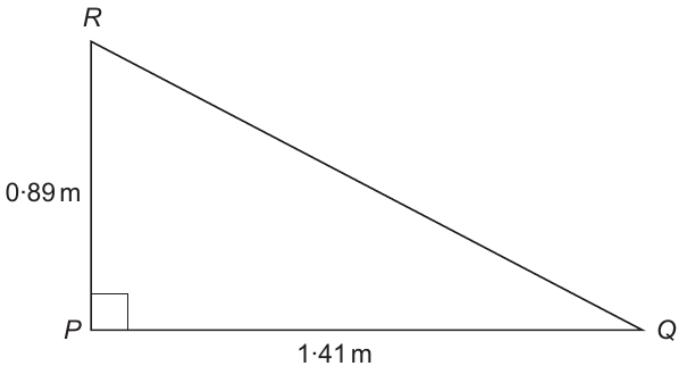

Diagram not drawn to scale

Calculate the length of *QR*. [3]

Examiner only

10. Is it possible to draw a **right-angled** triangle with the measurements shown below?
You must use calculations (not a scale drawing) to support your answer.
You must show all your working. [4]

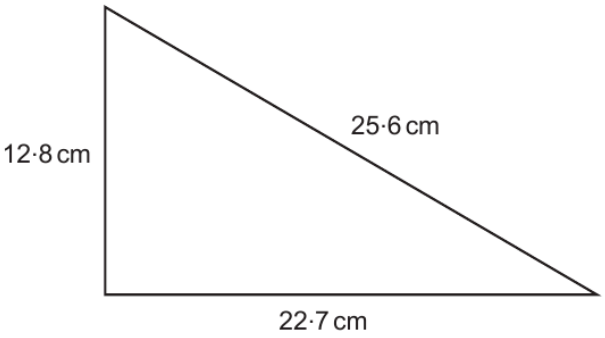

Diagram not drawn to scale

Examiner only

14. PQR is a right-angled triangle.
$PR = 16{\cdot}7\,\text{cm}$, $QR = 9{\cdot}6\,\text{cm}$.

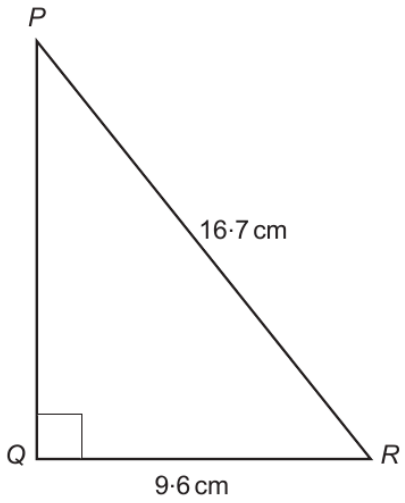

Diagram not drawn to scale

Calculate the size of $\hat{QPR}$. [3]

Examiner only

13. Show that the triangle below is **not** a right-angled triangle. [5]

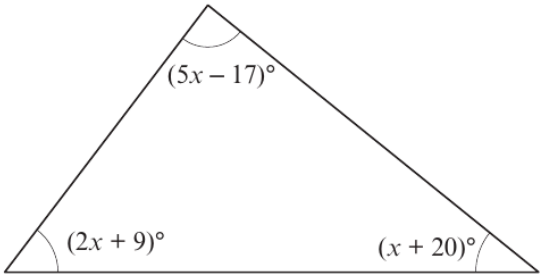

Diagram not drawn to scale

Examiner only

10. Use the formula $W = 7X + 2Y$ to find the value of W when $X = 35$ and $Y = 29$. [2]

11. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Geraint writes down three different **even** numbers.

The smallest number is $\frac{3}{5}$ of 200.

The range of his numbers is 4.

Which three different **even** numbers did Geraint write down?
You must show all your working. [3 + 2 OCW]

Examiner only

20. (a) Calculate the value of $(3\times10^{4})\div(6\times10^{-3})$.
Give your answer in standard form. [2]

(b) Calculate the value of $(4\cdot78\times10^{4})+(1\cdot5\times10^{2})$.
Give your answer in standard form. [2]

Examiner only

21. (a) Which complete method, using Pythagoras's Theorem, can be used to find x?
Circle your answer. [1]

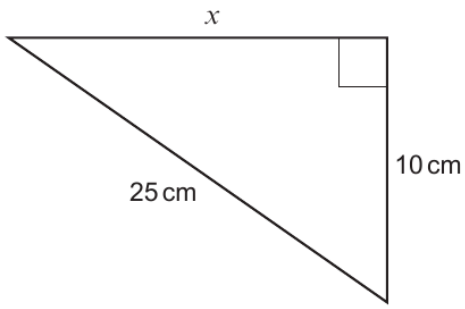

Diagram not drawn to scale

$x = 25^2 + 10^2$ $x = \sqrt{25^2 + 10^2}$ $x = 25^2 - 10^2$

$x = \sqrt{25^2 - 10^2}$ $x = \sqrt{(25 - 10)^2}$

(b) Which of the following calculations can be used to find y?
Circle your answer. [1]

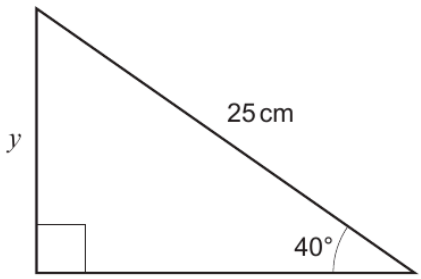

Diagram not drawn to scale

$\sin 25^\circ = y \times 40$ $\sin 40^\circ = \frac{25}{y}$ $\sin 25^\circ = \frac{y}{40}$

$\sin 40^\circ = \frac{y}{25}$ $\sin 40^\circ = y \times 25$

Examiner only

22. *P*, *Q* and *R* are points on the circumference of a circle with centre *O*.

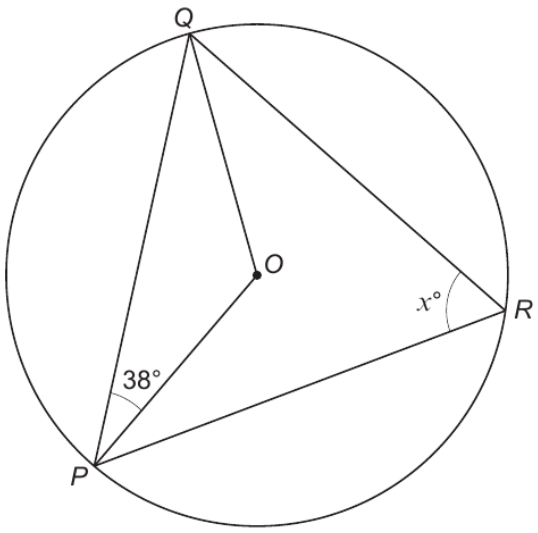

Diagram not drawn to scale

Calculate the value of x.
You must state **all** the angle properties that you use.
You must show all your working. [4]

Examiner only

23. On Monday morning, Twm picked n apples from a tree.
Ceri picked 5 times as many apples as Twm.

On Monday afternoon, Twm picked 19 more apples.
Ceri gave 7 of her apples to Twm.

Ceri still had more apples than Twm.

Write down an inequality in terms of n to show the above information.
Use your inequality to find the least possible number of apples Twm picked on Monday morning.
You must show all your working. [4]

END OF PAPER