

Name	Date started	Target end date

## WJEC GCSE Mathematics and Numeracy (Double Award) – Question Pack

12/24-hour clock conversion, time arithmetic and metric/imperial unit conversion. Sourced from legacy WJEC GCSE Mathematics and Mathematics-Numeracy H

**REVISE**  
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# 1.17 – Time, dates & unit conversions

## *Spec 1.9.1, 1.9.2, 1.9.3 – Unit 1 (calculator allowed)*

12/24-hour clock conversion, time arithmetic and metric/imperial unit conversion. Sourced from legacy WJEC GCSE Mathematics and Mathematics-Numeracy Higher and Intermediate papers, organised for revision under the 2025 spec.

2025 SPECIFICATION

### Estimated time for entire question pack: ~44 minutes

Derived from the GCSE Higher pace of ~1.5 min/mark (29 marks across 7 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 1 is the calculator-allowed paper).

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# Time, dates & unit conversions – what the new spec asks

WJEC GCSE Mathematics (first teaching 2025) · Unit 1: calculator-allowed.

## Time formats 1.9.1

- 12-hour and 24-hour clocks.
- AM/PM convention: AM before midday, PM after.
- Convert: 2:30 pm → 14:30; 23:15 → 11:15 pm.

## Time arithmetic 1.9.2

- Subtract hours first, then minutes – borrow if needed.
- Convert to minutes when crossing the hour or midnight.
- Watch “decimal hours”: 1.5 hr = 1 hr 30 min, not 1 hr 50.

## Metric unit conversions 1.9.3

- Length: 1 km = 1000 m; 1 m = 100 cm; 1 cm = 10 mm.
- Mass: 1 kg = 1000 g; 1 t = 1000 kg.
- Volume: 1 litre = 1000 ml; 1 m<sup>3</sup> = 1000 litres.

## Metric ↔ imperial 1.9.3

- 8 km ≈ 5 mi; 1 kg ≈ 2.2 lb; 1 litre ≈ 1.75 pints.
- 1 gallon = 8 pints = 4.55 litres.
- Multiply or divide by the conversion factor – check direction.

# Time, dates & unit conversions in one page

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

## 12-hour ↔ 24-hour

2:30 pm = 14:30 (add 12 to the hours).

00:00 = midnight; 12:00 = midday.

1:00 am = 01:00; 11:59 pm = 23:59.

## Time arithmetic

Subtract hours first, then minutes (regroup if needed).

14:25 - 11:50: hours 3, but 25 - 50 needs a borrow ⇒ 2 hr 35 min.

## Crossing midnight

Either convert both times to minutes-since-midnight, or split the journey at 24:00.

22:30 to 06:00 = (24:00 - 22:30) + 06:00 = 1:30 + 6:00 = 7 hr 30 min.

## Metric ↔ imperial

8 km ≈ 5 mi.

1 kg ≈ 2.2 lb.

1 litre ≈ 1.75 pints.

1 gallon = 8 pints = 4.55 litres.

## Unit conversion steps

Identify which way you're going.

Multiply by the rate to go 'to'; divide to go 'from'.

Cancel units along the way as a sense-check.

## Common traps

• Treating "decimal hours" (1.50) as 1 hr 50 min – it's 1 hr 30 min.

• Confusing kg/lb direction.

• Forgetting to convert at the right step.

Examiner only

2. (a) Megan and Rhodri both set out at the same time from home to go to the swimming pool. Rhodri travels by car. Megan cycles straight through the park.

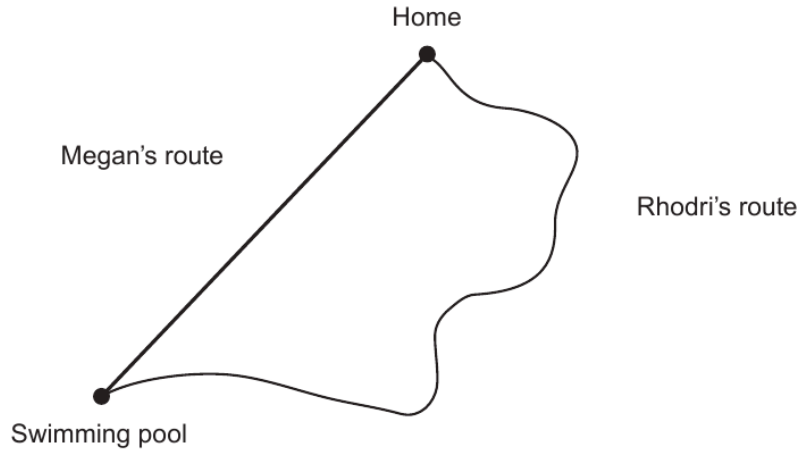


Diagram not drawn to scale

Rhodri's journey by car is 5.5 miles.  
His average speed for the journey is 22 mph.

Megan's average speed on her bike is 12 mph.  
Megan arrives at the swimming pool 5 minutes before Rhodri.

Calculate the distance Megan cycles.  
Give your answer in miles.  
You must show all your working.

[5]

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Distance Megan cycles is ..... miles



(b) Gary travelled a distance of 231 km in 3 hours and 30 minutes.  
Calculate Gary's average speed in km/h.  
Circle your answer.

[1]

0.015

1.1

66

70

77

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Examiner  
only

3310U601  
07



4. A helicopter pilot is planning a route from Milford Haven to Ruabon and then on to Swansea.



- (a) *In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

The plan for the flight is shown below.

Journey	Average speed	Time
Milford Haven to Ruabon	90 mph	1 hour 20 minutes
Ruabon to Swansea	80 mph	1 hour 15 minutes



Examiner  
only

Calculate the total distance of the flight.  
Give your answer in miles.  
You must show all your working.

[4 + 2 OCW]

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(b) On average, the helicopter uses 0.4 gallons of fuel per minute.

Remember: 1 gallon = 4.55 litres

Use this information to calculate how many litres of fuel the helicopter would be expected to use for the flight planned in (a).  
You must show all your working.

[5]

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Fuel = ..... litres

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Examiner  
only

3. Jac is planning to visit the Empire State Building in New York.

- (a) Planners had an original budget of \$60 million to construct the Empire State Building.  
It actually cost \$41 000 000 to construct.



Complete the following statement.  
Give your answer correct to 2 decimal places.

[3]

Constructing the Empire State Building cost ..... % less than the original budget.

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- (b) More than 4 million people visit the Empire State Building each year.  
What is 4 million written in standard form?  
Circle your answer.

[1]

$4 \times 10^{-5}$        $0.4 \times 10^5$        $4 \times 10^5$        $4 \times 10^6$        $4 \times 10^7$

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Examiner only

4. (a) (i) A single tree can absorb 48 **pounds** of carbon dioxide per year.  
 Calculate the carbon dioxide absorbed per year by a forest of 440 of these trees.  
 Give your answer in **kilograms**. [2]

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Carbon dioxide absorbed per year is ..... kg

(ii) A forest of trees absorbs  $2.3 \times 10^{11}$  grams of carbon dioxide per year.  
 Which of the following is  $2.3 \times 10^{11}$ ? Circle your answer. [1]

230 000 000 000      23 000 000 000      2 300 000 000 000

0.000 000 000 0023      0.000 000 000 023

(b)

Remember: $10\,000\text{m}^2 \approx 2.47$ acres
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A report states that a fire in a forest has a high risk of spreading when there are more than 60 trees per acre.

There are 615 trees in Grancwm Forest.  
 The forest covers an area of  $40\,000\text{m}^2$ .

Would a fire in Grancwm Forest have a high risk of spreading?

Yes       No

You must show all your working to support your answer. [4]

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Examiner only

- (c) A vertical pine tree stands on horizontal ground. From a point on the ground 21 metres from its base, the angle of elevation of the top of the pine tree is  $39^\circ$ .

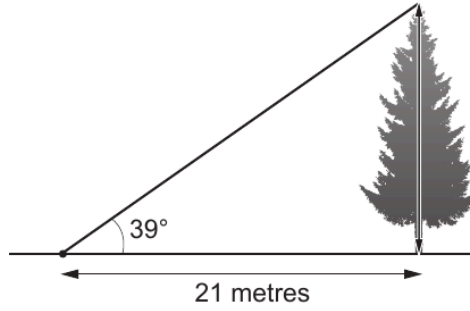


Diagram not drawn to scale

- (i) Show that the pine tree has a vertical height of 17 metres. [3]

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- (ii) A cylindrical log is cut from this pine tree. The **circumference** of the cross-section of the log is 1.75 m. The length of the log is half the height of the tree. Calculate the volume of the log. Give your answer in  $m^3$ . You must show all your working. [5]

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Volume of the log is .....  $m^3$



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09



Examiner  
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10. 7 water pumps can fill a swimming pool in 12 hours.  
These 7 water pumps work together at the same rate.

When the pool is empty, the 7 pumps are turned on.  
After working for 3 hours, 2 of the pumps are turned off.  
The other pumps carry on working until the swimming pool is full.

Calculate how long in total it takes for the swimming pool to be filled.  
Give your answer in hours and minutes.

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Total time taken for the pool to be filled = ..... hours ..... minutes

**END OF PAPER**



Examiner  
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8. Convert  $3.2 \times 10^4$  metres into miles.

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$3.2 \times 10^4$  metres is ..... miles

