

# E1.15 Time

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

**Total: 12 marks**

**KEY WORDS** 24-hour clock 二十四小时制 • duration 时长 • timetable 时刻表  
• average speed 平均速度 • decimal hours 小时的小数形式

## Objective

Build the skills to answer Extended exam questions on **time** 时间 — converting between the **12-hour** 十二小时制 and **24-hour clock** 二十四小时制, calculating **durations** 时长 that cross the hour, reading a **timetable** 时刻表, and using time in a **speed** 速度 calculation.

**You must be able to:**

- write a time in 24-hour clock form and back again
- find the length of a journey that crosses one or more hours
- convert a decimal number of hours into hours and minutes, and use it in  $\text{speed} = \text{distance} \div \text{time}$

## 1 Worked examples

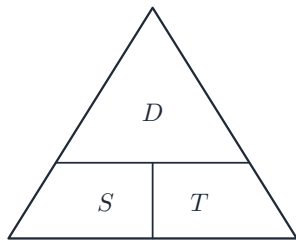
### ■ Time counts in sixties, not in tens

**The same instant, written two ways**

|         |           |            |           |           |           |            |
|---------|-----------|------------|-----------|-----------|-----------|------------|
| 12-hour | 9.00 a.m. | 12.00 noon | 1.00 p.m. | 4.30 p.m. | 7.15 p.m. | 11.50 p.m. |
|         | same      | same       | +12       | +12       | +12       | +12        |
| 24-hour | 09 00     | 12 00      | 13 00     | 16 30     | 19 15     | 23 50      |

A 24-hour time always has four digits and never a.m. or p.m. Midnight is **00 00** and midday is **12 00** – only afternoon and evening times gain the 12.

*Only afternoon and evening times gain the 12*



cover the one  
you want

$$S = \frac{D}{T} \quad (\text{cover } S: D \text{ over } T)$$

$$D = S \times T \quad (\text{cover } D: S \text{ next to } T)$$

$$T = \frac{D}{S} \quad (\text{cover } T: D \text{ over } S)$$

cyclist: 45 km in 3 h 45 min = 3.75 h  $\Rightarrow S = \frac{45}{3.75} = 12 \text{ km/h}$

*Time in a speed calculation must be in hours, as a decimal*

- **24-hour clock:** always four digits, never a.m. or p.m. 7.45 p.m. is 19 45.
- **Duration:** count on in stages. From 09 52 to 10 00 is 8 minutes, then to 12 00 is 2 hours, then 18 minutes more — 2 h 26 min.
- **Decimal hours:** 2.25 hours is 2 h 15 min, because  $0.25 \times 60 = 15$ . It is **not** 2 h 25 min.
- **Speed:** 1 h 48 min = 1.8 h, so 135 km in that time is  $135 \div 1.8 = 75 \text{ km/h}$ .

**Answer shapes** (marked by **method marks** — M1 for a correct method, A1 for the correct answer): converting minutes into a decimal of an hour, or counting the duration in stages, is the method mark.

## 2 Practice

**2.1** Write 7.45 p.m. as a 24-hour clock time. [1]

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**2.2** A film starts at 18 40 and lasts 2 hours 35 minutes. Find the time it finishes. [2]

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**2.3** A train leaves at 09 52 and arrives at 12 18. Find the journey time. [2]

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**2.4** Convert 2.25 hours into hours and minutes. [1]

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### 3 Exam-style questions

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**3.1** Part of a bus timetable is shown.

|     | <b>Depart A</b> | <b>Arrive B</b> | <b>Depart B</b> | <b>Arrive C</b> |
|-----|-----------------|-----------------|-----------------|-----------------|
| Bus | 08 47           | 09 23           | 09 31           | 10 09           |

(a) Find the time the bus takes to travel from A to B. [1]

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(b) Find the total time from leaving A to arriving at C. [2]

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**3.2** A journey of 135 km takes 1 hour 48 minutes. Calculate the average speed in km/h. [3]

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## Solutions

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Marking: **M1** a correct method, **A1** the correct answer.

Each answer shows the steps, then the **result**.

### 2.1

- p.m. after midday, so add 12 to the hour

$$\mathbf{19\ 45}$$

### 2.2

- $18\ 40 + 2\ \text{h} = 20\ 40$ , then  $+35\ \text{min}$  crosses the hour

$$= \mathbf{21\ 15}$$

### 2.3

- $09\ 52$  to  $12\ 00$  is  $2\ \text{h}\ 8\ \text{min}$ , then  $18\ \text{minutes}$  more

$$= \mathbf{2\ \text{h}\ 26\ \text{min}}$$

### 2.4

- $0.25 \times 60 = 15\ \text{minutes}$

$$= \mathbf{2\ \text{h}\ 15\ \text{min}}$$

### 3.1

(a)

- $08\ 47$  to  $09\ 23$  is  $13\ \text{minutes}$  to the hour and  $23\ \text{after}$

$$= \mathbf{36\ \text{minutes}}$$

(b)

- $08\ 47$  to  $10\ 09$

$$= \mathbf{1\ \text{h}\ 22\ \text{min}}$$

- the  $8\text{-minute}$  wait at B is part of the total, so do not subtract it

### 3.2

- convert the time:  $48\ \text{min} = 48 \div 60 = 0.8\ \text{h}$ , so the time is  $1.8\ \text{h}$
- speed = distance  $\div$  time =  $135 \div 1.8$

$$= \mathbf{75\ \text{km/h}}$$