

# C1.15 Time

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_ **Total: 20 marks**

**KEY WORDS** time zone 时区 • rate 比率

## Objective

Use time to solve Core IGCSE Mathematics problems.

**You must be able to:**

- Calculate durations across midnight
- Use 12-hour and 24-hour clock notation correctly
- Adjust time-zone differences and state the arrival day

## 1 Key knowledge and worked examples

### ■ Key knowledge: Time

One hour is 60 minutes; one minute is 60 seconds; one week is 7 days. Use 365 days for a year here. In 24-hour time, add 12 to a p.m. hour except noon. Find elapsed time in stages across midnight. For time zones, first convert departure time to the destination clock, then add travel time and check the date.

### ■ Worked example: Time

|              |               |               |
|--------------|---------------|---------------|
| 22:45 Monday | 00:00 Tuesday | 02:20 Tuesday |
|--------------|---------------|---------------|

A journey starts Monday at 22:45 and lasts 3 h 35 min.

- To midnight is 1 h 15 min.
- Remaining time:  $t = 3 \text{ h } 35 \text{ min} - 1 \text{ h } 15 \text{ min} = 2 \text{ h } 20 \text{ min}$ .
- Arrival is Tuesday at 02:20.
- If the destination clock is 2 hours ahead, its arrival time is Tuesday 04:20.

### ■ Method check

Write a timeline before adding durations. Apply the time-zone difference after finding the arrival on one consistent clock.

## 2 Practice

**2.1** Convert 4:35 p.m. and 00:20 to the other clock system. [2]

**2.2** Convert 2.5 hours to minutes and 185 seconds to minutes and seconds. [2]

**2.3** A train leaves at 09:48 and arrives at 12:17. Find its journey time. [2]

**2.4** Find the number of days in three weeks and in two years, using 365 days per year.[2]

## 3 Exam-style questions

**3.1** Apply the time methods below. Show working and include units where appropriate.

(a) A flight leaves Friday at 21:50 and takes 5 h 25 min. Find arrival time on the departure clock. [2]

(b) The destination is 3 hours behind. Find the local arrival time and day. [2]

(c) A connecting bus leaves at 01:10 local time. Find the waiting time. [2]

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**3.2** A train leaves on Saturday at 23:35. It travels for 2 h 50 min, waits for 20 min, then travels for 1 h 15 min.

(a) Find the total journey duration and arrival time and day. [3]

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(b) The arrival station clock is one hour ahead of the departure clock. Find local arrival and the wait until a bus at 06:30 local time. [3]

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## Solutions

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Award method and answer marks as indicated; accept equivalent correct methods.

### 2.1

- Add 12 to the p.m. hour: **16:35**. 00:20 is **12:20 a.m.**.

### 2.2

- $m = 2.5 \times 60 = \mathbf{150}$  min;  $185 = 3(60) + 5$ , so **3 min 5 s**.

### 2.3

- 09:48 to 11:48 is 2 h, then 29 min: **2 h 29 min**.

### 2.4

- $d_w = 3 \times 7 = \mathbf{21}$ ;  $d_y = 2 \times 365 = \mathbf{730}$ .

### 3.1

(a)

- Add 5 h to reach Saturday 02:50, then 25 min: **Saturday 03:15**.

(b)

- Subtract 3 h: **Saturday 00:15**.

(c)

- 00:15 to 01:10 is **55 minutes**.

### 3.2

(a)

- Total duration  $t = 2 \text{ h } 50 + 20 \text{ min} + 1 \text{ h } 15 = \mathbf{4 \text{ h } 25}$ .
- Arrival clock time **04:00**, on **Sunday**.

(b)

- Add one hour for the destination: **Sunday 05:00**.
- Wait  $w = 06:30 - 05:00 = \mathbf{1 \text{ h } 30 \text{ min}}$ .