

Exercise walk-through

C1.15

Time

IGCSE Mathematics

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

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The method

Method — 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.

Exercises 2.1-2.3

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]

Exercises 2.1-2.3

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

2.1

- Add 12 to the p.m. hour: **16:35**. 00:20 is **12:20 a.m.**.
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2.2 Convert 2.5 hours to minutes and 185 seconds to minutes and seconds. [2]

2.2

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

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

2.3

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

Exercise 2.4

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

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2.4

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

Exercise 3.1 (a)

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]

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(a)

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

Exercise 3.1 (b)

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

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

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(b)

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

Exercise 3.1 (c)

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

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

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(c)

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

Exercise 3.2 (a)

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]

Exercise 3.2 (a)

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

(a)

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

Exercise 3.2 (b)

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.

(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]

Exercise 3.2 (b)

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.

(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]

(b)

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