Unit 8 · Time

HARDER PRACTICE QUESTIONS · ANSWER KEY

Full marks 36

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Which bus is quickest?

ANSWER A · 5

i. 7:30 AM = **07:30**. 3:15 PM: 3 + 12 = 15, so **15:15**.

ii. Day bus A: 14 h 10 min − 6 h 45 min = 13 h 70 min − 6 h 45 min = **7 h 25 min**.
Day bus B: 15 h 15 min − 7 h 30 min = 14 h 75 min − 7 h 30 min = **7 h 45 min**.
Night bus: 21:15 to midnight is 2 h 45 min, and midnight to 04:50 is 4 h 50 min. 2 h 45 min + 4 h 50 min = 6 h 95 min = **7 h 35 min**.

iii. **Day bus A**, with 7 h 25 min.

iv. 04:50 is before noon: **4:50 AM**.

MARKING SCHEME

- ✓ 07:30 and 15:15.
- ✓ Day bus A, 7 h 25 min.
- ✓ Day bus B, 7 h 45 min.
- ✓ Night bus, 7 h 35 min, in two parts round midnight.
- ✓ Day bus A is quickest; 4:50 AM.

2 Through the night

ANSWER A · 3

4:30 PM = 16:30. Add the trip: 16 h 30 min + 14 h 45 min = 30 h 75 min = 31 h 15 min.
A day has only 24 hours, so this is the next day: 31 h 15 min − 24 h = 7 h 15 min.
The bus arrives at **07:15 the next morning**, which is **7:15 AM**.

MARKING SCHEME

- ✓ 16:30 + 14 h 45 min = 31 h 15 min.
- ✓ Take away 24 hours: 07:15 the next day.
- ✓ 7:15 AM.

3 Work backwards

ANSWER A · 3

At the airport: 07:40 − 2 h = **05:40**.
Leave home: 05:40 − 50 min = 4 h 100 min − 50 min = **04:50**.
Wake up: 04:50 − 35 min = **04:15**, which is **4:15 AM**.

MARKING SCHEME

- ✓ 05:40 at the airport.
- ✓ 04:50 to leave home.
- ✓ 4:15 AM.

Science Playground, Katunje, Bhaktapur
Book a class visit: https://science-playground.com/booking

4 Spot the errors

ANSWER U · 3

i. 12:20 AM is 20 minutes after **midnight**, so it is **00:20**. 12:20 is twenty minutes after noon.

ii. $18 - 12 = 6$, so 18:45 is **6:45 PM**. He dropped the 1 instead of taking away 12.

iii. 30 minutes is $\frac{30}{60} = \frac{1}{2}$ of an hour, so it is $\mathbf{2\frac{1}{2}}$ **hours** (or 150 minutes). Time doesn't carry at 10, so 2.30 is wrong.

MARKING SCHEME

- ✓ 00:20, because 12:xx AM is just after midnight.
- ✓ 6:45 PM, by taking away 12.
- ✓ $2\frac{1}{2}$ hours, because 30 minutes is half an hour.

5 Sixteen songs

ANSWER A · 3

Multiply each unit by 16: 45 s × 16 = 720 s, and 3 min × 16 = 48 min.
720 s ÷ 60 = 12, so 720 s = 12 min exactly. 48 min + 12 min = 60 min.
60 min = 1 hour. So it is **exactly 1 hour** (1 h 0 min 0 s).

MARKING SCHEME

- ✓ 720 s and 48 min.
- ✓ 720 s = 12 min, so 60 min.
- ✓ Exactly 1 hour.

6 A school day

ANSWER A · 4

i. 10:00 to 15:45 is 5 h 45 min = 5 × 60 + 45 = 345 min. Without the break: 345 − 30 = 315 min. 315 ÷ 7 = **45 minutes** a class.

ii. Four classes: 4 × 45 = 180 min = 3 h. The break starts at 10:00 + 3 h = 13:00, which is **1:00 PM**.

iii. The break ends at 13:30. The 5th class is 13:30 to 14:15, so the 6th class starts at **14:15** (2:15 PM).

Check: the 7th class is 15:00 to 15:45. ✓

MARKING SCHEME

- ✓ 315 minutes for the classes.
- ✓ 45 minutes a class.
- ✓ 1:00 PM.
- ✓ 14:15 (2:15 PM).

7 Seven times as old

ANSWER HA · 4

i. 8 months × 7 = 56 months, and 9 years × 7 = 63 years. 56 months = 4 years 8 months (4 × 12 = 48). 63 + 4 = **67 years 8 months**.

ii. 9 years ÷ 2 = 4 years, and 1 year is left over. 1 year = 12 months, and 12 + 8 = 20 months. 20 ÷ 2 = 10 months. **4 years 10 months**.

iii. 9 y 8 m − 4 y 10 m = 8 y 20 m − 4 y 10 m = **4 years 10 months**. Her brother is half her age, so the other half of her age is the difference.

MARKING SCHEME

- ✓ 56 months = 4 years 8 months.
- ✓ Grandfather 67 years 8 months.
- ✓ Brother 4 years 10 months.
- ✓ Difference 4 years 10 months, the other half.

Science Playground, Katunje, Bhaktapur
Book a class visit: https://science-playground.com/booking

8 Days of the week

ANSWER U · 4

i. Asoj 22 is 21 days after Asoj 1. 21 days = 3 weeks exactly, so it was a **Saturday**.
ii. Asoj 31 is 30 days after Asoj 1. 30 days = 4 weeks 2 days. Saturday + 2 days: **Monday**.
iii. Kartik 1 is the day after Asoj 31: **Tuesday**.
iv. Kartik 15 is 14 days, 2 weeks, after Kartik 1: **Tuesday**.

MARKING SCHEME

✓ Saturday.
✓ Monday.
✓ Tuesday.
✓ Tuesday.

9 A call to Tokyo

ANSWER A · 3

i. 19 h 30 min + 3 h 15 min = **22:45**, which is **10:45 PM**.
ii. Nepal is 3 h 15 min behind: 23:00 − 3 h 15 min = 22 h 60 min − 3 h 15 min = **19:45** (7:45 PM).
iii. 08:00 − 3 h 15 min = 7 h 60 min − 3 h 15 min = **04:45**, which is 4:45 AM. Very early for Nishma!

MARKING SCHEME

✓ 22:45, 10:45 PM.
✓ 19:45.
✓ 04:45.

10 Think: a lakh of seconds

ANSWER HA · 4

One day = 24 × 60 × 60 = **86,400 seconds**. 1,00,000 is more, so 1 lakh seconds is **more than a day**.
Seconds to minutes: 1,00,000 ÷ 60 = 1666, remainder 40 (60 × 1666 = 99,960). So 1666 min 40 s.
Minutes to hours: 1666 ÷ 60 = 27, remainder 46 (60 × 27 = 1620). So 27 h 46 min 40 s.
Hours to days: 27 h = 1 day 3 h.
1 lakh seconds = 1 day 3 hours 46 minutes 40 seconds.

MARKING SCHEME

✓ A day is 86,400 s, so more than a day.
✓ 1666 min 40 s.
✓ 27 h 46 min 40 s.
✓ 1 day 3 h 46 min 40 s.

See it at Science Playground

Exhibits and plants at the center, Bhaktapur, that go with this unit. Book a class visit at science-playground.com/booking.

- **The Solar Ring Clock** (exhibit): Its ring counts hours like a 12-hour clock: after 12 come 1, 2… Light through 2 in the afternoon means 14:00 in 24-hour time.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	0	7	21	8	**36**

Science Playground, Katunje, Bhaktapur
Book a class visit: https://science-playground.com/booking