# Unit 9 · Distance

**HARDER PRACTICE QUESTIONS · ANSWER KEY**

Full marks 34

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

## 1 Shortest to longest

**ANSWER** U · 3

Change them all into meters:
2 km 50 m = **2050 m**; 2500 m; 2 km 5 m = **2005 m**; 2,05,000 cm ÷ 100 = **2050 m**; 2,00,500 mm ÷ 10 = 20,050 cm, and 20,050 cm ÷ 100 = **200 m 50 cm**.

i. **2 km 50 m and 2,05,000 cm** are equal.

ii. **2,00,500 mm, 2 km 5 m, 2 km 50 m = 2,05,000 cm, 2500 m.** The one with the biggest number is the shortest!

**MARKING SCHEME**

- ✓ All five in the same unit.
- ✓ 2 km 50 m and 2,05,000 cm are equal.
- ✓ The order, shortest first.

## 2 Work backwards

**ANSWER** A · 3

The 6 pieces: 35 cm × 6 = 210 cm, and 1 m × 6 = 6 m. 210 cm = 2 m 10 cm, so 6 m + 2 m 10 cm = **8 m 10 cm**.
Add the piece left over: 8 m 10 cm + 40 cm = **8 m 50 cm**.
Check: 8 m 50 cm = 850 cm, and 850 − 40 = 810 = 6 × 135. ✓

**MARKING SCHEME**

- ✓ 6 pieces: 8 m 10 cm.
- ✓ Add the 40 cm left over.
- ✓ 8 m 50 cm.

## 3 Poles for prayer flags

**ANSWER** HA · 4

i. Put both in cm: 45 m = 4500 cm, and 2 m 50 cm = 250 cm. 4500 ÷ 250 = **18 spaces**.

ii. There is one pole at the start, then one at the end of each space: 1 + 18 = **19 poles**.

iii. A 5 m path has 500 ÷ 250 = 2 spaces, but **3 poles**: one at each end and one in the middle. Nishant counted the spaces, not the poles. There is always one more pole than spaces.

**MARKING SCHEME**

- ✓ 4500 cm and 250 cm.
- ✓ 18 spaces.
- ✓ 19 poles.
- ✓ One more pole than spaces, shown with the short path.



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## 4 Spot the error

**ANSWER** U · 3

i. 5 km ÷ 4 = 1 km, and **1 km is left over**. 1 km = 1000 m, and 1000 + 40 = 1040 m. 1040 ÷ 4 = 260 m. So the answer is **1 km 260 m**.
ii. She forgot the kilometer left over. She divided only the 40 m by 4.
iii. 1 km 10 m × 4 = 4 km 40 m, not 5 km 40 m. (And 1 km 260 m × 4 = 4 km 1040 m = 5 km 40 m. ✓)

**MARKING SCHEME**

- ✓ 1 km 260 m.
- ✓ The 1 km left over was forgotten.
- ✓ 1 km 10 m × 4 = 4 km 40 m.

## 5 A porter's day

**ANSWER** A · 4

i. This is "a length ÷ a length": put both in m. 9 km 600 m = 9600 m, and 2 km 400 m = 2400 m. 9600 ÷ 2400 = 96 ÷ 24 = **4 hours**.
ii. Walking and rest: 4 h + 45 min = 4 h 45 min. 7 h 15 min + 4 h 45 min = 11 h 60 min = 12 h. He arrives at **12:00 noon**, which is **12:00**.

**MARKING SCHEME**

- ✓ 9600 m and 2400 m.
- ✓ 4 hours of walking.
- ✓ 4 h 45 min in all.
- ✓ 12:00 noon (12:00).

## 6 A pile of books

**ANSWER** A · 4

i. 30 cm 4 mm = 304 mm. 304 ÷ 8 = 38 mm = **3 cm 8 mm**.
ii. 1 m = 100 cm = 1000 mm. 1000 ÷ 38 = 26, remainder 12 (38 × 26 = 988). So **26 books** fit, with **12 mm = 1 cm 2 mm** of space left.

**MARKING SCHEME**

- ✓ 304 mm.
- ✓ 3 cm 8 mm.
- ✓ 1000 mm.
- ✓ 26 books, 1 cm 2 mm left.

## 7 On the map

**ANSWER** HA · 3

i. 1 cm = 10 mm stands for 5 km = 5000 m. So 1 mm stands for 5000 ÷ 10 = **500 m**.
ii. 7 cm stand for 7 × 5 = 35 km. 4 mm stand for 4 × 500 = 2000 m = 2 km. In all **37 km**.
iii. 52 ÷ 5 = 10, remainder 2. So 10 cm for 50 km, and 2 km = 2000 m, which is 2000 ÷ 500 = 4 mm. **10 cm 4 mm**.

**MARKING SCHEME**

- ✓ 1 mm for 500 m.
- ✓ 37 km.
- ✓ 10 cm 4 mm.

## 8 Above Sagarmatha

**ANSWER**

Sagarmatha: 8,848.86 m = 8 km 848 m 86 cm. The plane: 10 km 500 m 0 cm.
cm: 0 − 86 can't be done, so break 1 m: 100 − 86 = 14 cm, and 499 m are left.
m: 499 − 848 can't be done, so break 1 km: 1499 − 848 = 651 m, and 9 km are left.
km: 9 − 8 = 1.


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**1 km 651 m 14 cm.** A · 3

Check: 8 km 848 m 86 cm + 1 km 651 m 14 cm = 9 km 1499 m 100 cm = 10 km 500 m. ✓
(Sagarmatha's height is the official one, from the unit. The plane is made up.)

MARKING SCHEME

- ✓ 8 km 848 m 86 cm.
- ✓ Breaking a meter and a kilometer.
- ✓ 1 km 651 m 14 cm.

## 9 Think: up and down the pole

ANSWER HA · 4

i.

| Day | End of the day | End of the night |
|---|---|---|
| 1 | 30 cm | 10 cm |
| 2 | 40 cm | 20 cm |
| 3 | 50 cm | 30 cm |
| 4 | 60 cm | 40 cm |
| 5 | 70 cm | 50 cm |
| 6 | 80 cm | 60 cm |
| 7 | 90 cm | 70 cm |
| 8 | 100 cm: the top | |

ii. **Day 8.**

iii. On the last day the snail climbs the full 30 cm and reaches the top before night comes, so it never slides back. It only has to be at 70 cm at the start of a day. Dividing by 10 counts a slide on the last night that never happens.

MARKING SCHEME

- ✓ The table, 10 cm more each night.
- ✓ 70 cm after night 7.
- ✓ Day 8.
- ✓ On the last day it reaches the top and doesn't slide back.

## 10 Make your own

ANSWER HA · 3

The length must be 3 km 250 m × 4: 250 m × 4 = 1000 m = 1 km, and 3 km × 4 = 12 km. So it is **13 km**.

For example: "A road 13 km long is shared equally among 4 teams to clean. How much does each team clean?"

13 km ÷ 4 = 3 km, with 1 km left. 1 km = 1000 m, and 1000 ÷ 4 = 250 m. **3 km 250 m.** ✓

MARKING SCHEME

- ✓ The length is 13 km.
- ✓ A problem that shares 13 km among 4.
- ✓ Solved back to 3 km 250 m.

## 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.

- **How Tall Are You?** (exhibit): Stand against the scale and read your height in centimeters. Then change it into meters and centimeters: 135 cm is 1 m 35 cm.

| Marks by level | Knowledge | Understanding | Application | Higher ability | Total |
|---|---|---|---|---|---|
| **Marks** | 0 | 6 | 14 | 14 | **34** |



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