Unit 9 · Distance

HARDER PRACTICE QUESTIONS · ANSWER KEY

Full marks 29

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

1 Spot the error

ANSWER U · 3

i. A foot has **12** inches, not 10, so 6 inches is not 0.6 ft.
ii. 6 in = 6 ÷ 12 = 0.5 ft, so she is **5.5 ft** tall.
iii. 5 × 12 + 6 = 66 in, and 66 × 2.54 = **167.64 cm**.

MARKING SCHEME

✓ 1 ft = 12 in, so 6 in ≠ 0.6 ft.
✓ 5.5 ft.
✓ 167.64 cm.

2 Put them in order

ANSWER A · 3

All in centimeters: 1.2 m = 120 cm; 4 ft = 4 × 30.48 = 121.92 cm; 47 in = 47 × 2.54 = 119.38 cm; 125 cm.
Shortest first: **47 in, 1.2 m, 4 ft, 125 cm**.

MARKING SCHEME

✓ All four changed into one unit.
✓ 121.92 cm and 119.38 cm.
✓ The right order.

3 Who is taller?

ANSWER A · 3

i. 5 × 12 + 2 = 62 in, and 62 × 2.54 = **157.48 cm**.
ii. **Yangchen**, by 160 − 157.48 = **2.52 cm**.
iii. 2.52 ÷ 2.54 is just under 1: **about 1 inch**.

MARKING SCHEME

✓ 157.48 cm.
✓ Yangchen, by 2.52 cm.
✓ About 1 inch.

4 Shelves from a plank

ANSWER A · 3

i. 12 ft = 144 in, and each shelf is 2 × 12 + 9 = 33 in. 144 ÷ 33 = 4, with 12 left over: **4 shelves**.
ii. 144 − 4 × 33 = 144 − 132 = **12 in** (exactly 1 ft).
iii. 12 × 2.54 = **30.48 cm**.

MARKING SCHEME

✓ Both lengths in inches, 144 and 33.
✓ 4 shelves.
✓ 12 in, which is 30.48 cm.

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5 Will the TV fit?

ANSWER A · 3

i. **Yes**: $43 \times 2.54 = 109.22$ cm.

ii. A TV's size is the length of its screen's **diagonal**, from one corner to the opposite corner, not its width. The width is shorter than the diagonal, so the TV may still fit.

iii. The TV's **width** (with its frame), to compare with the 100 cm gap.

MARKING SCHEME

- ✓ 109.22 cm is right.
- ✓ 43 inches is the diagonal, which is longer than the width.
- ✓ Measure or ask the TV's width.

6 Two answers, both fine

ANSWER HA · 4

i. Bhumika: 2 km = 2000 m, and $2000 \times 3.28 =$ **6560 ft**. Saugat: 2 km = 200000 cm, and $200000 \div 30.48 = 6561.679\ldots \approx$ **6561.68 ft**.

ii. Bhumika used 1 m $\approx$ 3.28 ft, which is **rounded**; Saugat used 1 ft = 30.48 cm, which is **exact**.

iii. **Saugat's**: he used only exact numbers and rounded once, at the end.

iv. They differ by under 2 ft in more than 6500 ft, which doesn't matter for a walk or a road. Bhumika's answer should be written as "about 6560 ft".

MARKING SCHEME

- ✓ Both ways shown.
- ✓ One used a rounded number, the other an exact one.
- ✓ Saugat's is closer, with the reason.
- ✓ The difference is tiny for a length of 2 km.

7 Round a ropani

ANSWER A · 3

i. $74 \times 30.48 = 2255.52$ cm = **22.56 m** (22.5552 m).

ii. $4 \times 74 =$ **296 ft**, and $296 \times 30.48 = 9022.08$ cm $\approx$ **90.22 m** (or $4 \times 22.5552 \approx 90.22$ m).

MARKING SCHEME

- ✓ 22.56 m.
- ✓ 296 ft.
- ✓ About 90.22 m.

8 Make your own

ANSWER A · 3

For example: **"A door is 2 ft 6 in wide. How wide is it in centimeters?"**

2 ft 6 in $= 2 \times 12 + 6 = 30$ in, and $30 \times 2.54 =$ **76.2 cm**.

Any problem is right if its length is 30 inches written in feet and inches (2 ft 6 in) and it asks for centimeters.

MARKING SCHEME

- ✓ A problem with a length in feet and inches.
- ✓ The length is 2 ft 6 in (30 in).
- ✓ $30 \times 2.54 = 76.2$ cm.

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9 Think: growing to 5 feet

ANSWER HA · 4

i. 5 ft − 4 ft 11 in = **1 in**, which is **2.54 cm**. (Or 60 × 2.54 − 59 × 2.54 = 152.4 − 149.86 = 2.54.)

ii. After 1 year she has grown 2 cm, not yet 2.54 cm. After **2 years** she has grown 4 cm.

iii. 149.86 + 4 = **153.86 cm**.

iv. 5 ft 1 in = 61 in = 154.94 cm, so she is a little **less** than 5 ft 1 in. (153.86 ÷ 2.54 ≈ 60.57 in: 5 ft and about half an inch.)

MARKING SCHEME

- ✓ 2.54 cm (one inch).
- ✓ 2 years.
- ✓ 153.86 cm.
- ✓ Less than 5 ft 1 in (154.94 cm).

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): Read your height in centimeters, then change it into feet and inches, the way people often say it: 1 ft = 30.48 cm and 1 in = 2.54 cm.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	0	3	18	8	**29**

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