Unit 5 · Fraction

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 Not enough quarters

ANSWER HA · 3

Change both into improper fractions: $5\frac{1}{4} = \frac{4\times5+1}{4} = \frac{21}{4}$ and $2\frac{3}{4} = \frac{4\times2+3}{4} = \frac{11}{4}$.

$\frac{21}{4} - \frac{11}{4} = \frac{21-11}{4} = \frac{10}{4} = 2\frac{2}{4}$

$\mathbf{2\frac{2}{4}}$ **m** of rope is left. Check: $2\frac{2}{4} + 2\frac{3}{4} = 4\frac{5}{4} = 5\frac{1}{4}$. ✓

MARKING SCHEME

✓ $\frac{21}{4}$ and $\frac{11}{4}$.

✓ $\frac{10}{4}$.

✓ $2\frac{2}{4}$ m.

2 Work backwards

ANSWER A · 4

i. One whole is $\frac{8}{8}$. $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$, so the missing part is $\frac{8}{8} - \frac{5}{8} = \mathbf{\frac{3}{8}}$.

ii. Undo the taking away: add $2\frac{5}{9}$ back. Wholes $1 + 2 = 3$. Ninths $\frac{7}{9} + \frac{5}{9} = \frac{12}{9} = 1\frac{3}{9}$. So the missing number is $3 + 1\frac{3}{9} = \mathbf{4\frac{3}{9}}$.

Check: $4\frac{3}{9} - 2\frac{5}{9} = \frac{39}{9} - \frac{23}{9} = \frac{16}{9} = 1\frac{7}{9}$. ✓

MARKING SCHEME

✓ i. One whole is $\frac{8}{8}$.

✓ i. $\frac{3}{8}$.

✓ ii. Add $2\frac{5}{9}$ back to $1\frac{7}{9}$.

✓ ii. $4\frac{3}{9}$.

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3 Spot the error

ANSWER U · 3

i. He added the **denominators** too. The denominator is the size of a piece, and it doesn't change when you add.

ii. Adding $\frac{2}{7}$ to $\frac{3}{7}$ must give **more** than $\frac{3}{7}$. But a fourteenth is half a seventh, so $\frac{3}{7}$ is 6 fourteenths, and $\frac{5}{14}$ is **less** than that.

iii. $\frac{2+3}{7} = \mathbf{\frac{5}{7}}$.

MARKING SCHEME

✓ He added the denominators.

✓ $\frac{5}{14}$ is less than $\frac{3}{7}$, but the sum must be more.

✓ $\frac{5}{7}$.

4 Getting to school

ANSWER A · 4

i. $32 - 12 - 9 = 20 - 9 = \mathbf{11}$ students.

ii. $\mathbf{\frac{11}{32}}$.

iii. **Way 1:** $\frac{9}{32} + \frac{11}{32} = \frac{20}{32}$.

Way 2: everyone except those who walk: $\frac{32}{32} - \frac{12}{32} = \frac{20}{32}$.

Both give $\mathbf{\frac{20}{32}}$.

MARKING SCHEME

✓ 11 by bicycle.

✓ $\frac{11}{32}$.

✓ $\frac{20}{32}$ by adding.

✓ $\frac{20}{32}$ by taking away from the whole.

5 Put them in order

ANSWER U · 3

Change the improper fractions into mixed numbers: $\frac{17}{5} = 3\frac{2}{5}$ and $\frac{16}{5} = 3\frac{1}{5}$.

So $3\frac{1}{5}$ and $\frac{16}{5}$ are **equal**.

Order: $\mathbf{2\frac{4}{5}}$, $\mathbf{3\frac{1}{5} = \frac{16}{5}}$, $\mathbf{\frac{17}{5}}$.

MARKING SCHEME

✓ $\frac{17}{5} = 3\frac{2}{5}$ and $\frac{16}{5} = 3\frac{1}{5}$.

✓ $3\frac{1}{5}$ and $\frac{16}{5}$ are equal.

✓ The order, smallest first.

6 Building a road

ANSWER

i. Wholes $2 + 1 = 3$. Eighths $\frac{3}{8} + \frac{7}{8} = \frac{10}{8} = 1\frac{2}{8}$. So $3 + 1\frac{2}{8} = \mathbf{4\frac{2}{8}}$ **km**.

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ii. $6 = \frac{48}{8}$ and $4\frac{2}{8} = \frac{34}{8}$. $\frac{48}{8} - \frac{34}{8} = \frac{14}{8} = \mathbf{1\frac{6}{8}}$ **km**. **A · 4**

Check: $4\frac{2}{8} + 1\frac{6}{8} = 5\frac{8}{8} = 6$. ✓

MARKING SCHEME

✓ $\frac{10}{8} = 1\frac{2}{8}$.

✓ $4\frac{2}{8}$ km built.

✓ 6 and $4\frac{2}{8}$ as eighths.

✓ $1\frac{6}{8}$ km left.

7 Whole numbers in between

ANSWER **A · 3**

$\frac{23}{4}$: $23 \div 4 = 5$, remainder 3, so $5\frac{3}{4}$.

$\frac{41}{4}$: $41 \div 4 = 10$, remainder 1, so $10\frac{1}{4}$.

The whole numbers between them are **6, 7, 8, 9 and 10**.

MARKING SCHEME

✓ $5\frac{3}{4}$.

✓ $10\frac{1}{4}$.

✓ 6, 7, 8, 9 and 10.

8 Is it possible?

ANSWER **HA · 4**

i. **Yes.** For example $\frac{3}{8} + \frac{5}{8} = \frac{8}{8} = 1$.

ii. **No.** Each proper fraction is less than 1, so two of them make less than 2.

iii. **Yes.** For example $\frac{9}{4} - \frac{7}{4} = \frac{2}{4}$.

iv. **No.** In an improper fraction the numerator is as big as the denominator or bigger, so it is one whole or more.

MARKING SCHEME

✓ i. Yes, with an example.

✓ ii. No, each is less than 1.

✓ iii. Yes, with an example.

✓ iv. No, it is 1 or more.

9 Two fractions from clues

ANSWER **HA · 3**

$1\frac{4}{9} = \frac{13}{9}$. So the two numerators add up to 13 and are 1 apart.

Try pairs that add up to 13: 12 and 1, 11 and 2, ..., 7 and 6. Only **7 and 6** are 1 apart.

The fractions are $\mathbf{\frac{7}{9}}$ **and** $\mathbf{\frac{6}{9}}$. Check: $\frac{7}{9} + \frac{6}{9} = \frac{13}{9} = 1\frac{4}{9}$ and $\frac{7}{9} - \frac{6}{9} = \frac{1}{9}$. ✓

MARKING SCHEME

✓ The numerators add up to 13.

✓ The numerators are 7 and 6.

✓ $\frac{7}{9}$ and $\frac{6}{9}$, checked.

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10 Think

ANSWER HA · 3

They ate the same amount. Salina ate $\frac{3}{12}$ and Abhishek $\frac{1}{4}$. Break each quarter of a bar into 3 equal pieces: you get 12 pieces, and one quarter becomes 3 of them. So $\frac{1}{4} = \frac{3}{12}$.

Abhishek's one piece is bigger, but Salina ate three smaller pieces that together make the same amount.

MARKING SCHEME

- ✓ The same amount.
- ✓ A drawing, or words, showing a quarter as 3 twelfths.
- ✓ One big piece equals three small pieces together.

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.

- **Tangram Puzzle** (exhibit): Each small triangle is 1/16 of the whole square. Lay both on the square piece: they cover it, so it is 1/16 + 1/16 = 2/16.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	0	6	15	13	**34**

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