Answers - Adding and subtracting fractions

Year: Year 4

Answer to Question 1

a. $\frac{2}{5}$ is shaded and $\frac{3}{5}$ is not.
b. $\frac{5}{8}$ is shaded and $\frac{3}{8}$ is not.
c. $\frac{7}{10}$ is shaded and $\frac{3}{10}$ is not.
d. $\frac{3}{4}$ is shaded and $\frac{1}{4}$ is not.

Answer to Question 2

a. The denominator goes from 2 to 8, which is × 4. So $\frac{1}{2} = \frac{4}{8}$.
b. The denominator goes from 4 to 8, which is × 2. So $\frac{3}{4} = \frac{6}{8}$.
c. The denominator goes from 3 to 12, which is × 4. So $\frac{2}{3} = \frac{8}{12}$.
d. The denominator goes from 10 to 2, which is ÷ 5. So $\frac{5}{10} = \frac{1}{2}$.

Answer to Question 3

a. Add the numerators and keep the denominator: 2 + 3 = 5, so $\frac{2}{9} + \frac{3}{9} = \frac{5}{9}$.
b. Add the numerators and keep the denominator: 4 + 5 = 9, so $\frac{4}{10} + \frac{5}{10} = \frac{9}{10}$.
c. Add the numerators and keep the denominator: 5 + 4 = 9, so $\frac{5}{6} + \frac{4}{6} = \frac{9}{6}$, which is $1\frac{3}{6}$ as a mixed number.
d. Add the numerators and keep the denominator: 3 + 5 = 8, so $\frac{3}{8} + \frac{5}{8} = \frac{8}{8}$, which is 1 whole.

Answer to Question 4

a. Subtract the numerators and keep the denominator: 5 − 2 = 3, so $\frac{5}{7} - \frac{2}{7} = \frac{3}{7}$. It cannot be simplified.
b. Subtract the numerators and keep the denominator: 9 − 4 = 5, so $\frac{9}{10} - \frac{4}{10} = \frac{5}{10}$. This can be simplified to $\frac{1}{2}$.
c. Subtract the numerators and keep the denominator: 11 − 5 = 6, so $\frac{11}{12} - \frac{5}{12} = \frac{6}{12}$. This can be simplified to $\frac{1}{2}$.
d. Subtract the numerators and keep the denominator: 6 − 3 = 3, so $\frac{6}{6} - \frac{3}{6} = \frac{3}{6}$. This can be simplified to $\frac{1}{2}$.

Answer to Question 5

a. $7 \div 4 = 1$ remainder 3, so $\frac{7}{4} = \mathbf{1\ \frac{3}{4}}$.
b. $11 \div 5 = 2$ remainder 1, so $\frac{11}{5} = \mathbf{2\ \frac{1}{5}}$.
c. 2 wholes = 6 thirds, so $2\ \frac{1}{3} = 6$ thirds + 1 third = $\mathbf{\frac{7}{3}}$.
d. 1 whole = 8 eighths, so $1\ \frac{3}{8} = 8 + 3 = \mathbf{\frac{11}{8}}$.

Answer to Question 6

a. $\frac{3}{4}$ of 20: $20 \div 4 = 5$, then $3 \times 5 = \mathbf{15}$.
b. $\frac{2}{5}$ of 30: $30 \div 5 = 6$, then $2 \times 6 = \mathbf{12}$.
c. $\frac{5}{6}$ of 24: $24 \div 6 = 4$, then $5 \times 4 = \mathbf{20}$.
d. $\frac{7}{10}$ of 50: $50 \div 10 = 5$, then $7 \times 5 = \mathbf{35}$.

Answer to Question 7

a. Anna: $\mathbf{\frac{2}{8}}$; Ben: $\mathbf{\frac{3}{8}}$; Cara: $\mathbf{\frac{1}{8}}$.
b. $2 + 3 = 5$, so $\mathbf{\frac{5}{8}}$.
c. $2 + 3 + 1 = 6$ slices are eaten, so 2 slices are left: $\mathbf{\frac{2}{8}} = \frac{1}{4}$. Check: $\frac{8}{8} - \frac{6}{8} = \frac{2}{8}$.
d. Yes, he is **right**. 2 slices out of 8 is $\frac{2}{8}$, which is the same as $\frac{1}{4}$ of the pizza.

Answer to Question 8

a. Add the numerators and keep the denominator: $3 + 4 = 7$, so $\frac{3}{10} + \frac{4}{10} = \frac{7}{10}$. So $\mathbf{\frac{7}{10}}$.
b. $3 + 4 + 2 = 9$, so they drink $\mathbf{\frac{9}{10}}$ in total.
c. $\mathbf{\frac{1}{10}}$ is not drunk: $\frac{10}{10} - \frac{9}{10} = \frac{1}{10}$.
d. $50 \div 10 = 5$, so **5 bottles** were not drunk.

Answer to Question 9

a. $\mathbf{\frac{5}{12}}$ of the garden.
b. $3 + 2 = 5$, so $\frac{5}{12}$ has carrots and beans. This cannot be simplified because 5 and 12 have no common factor.
c. $5 + 3 + 2 = 10$ beds are used, so 2 beds are empty: $\mathbf{\frac{2}{12} = \frac{1}{6}}$.
d. Half of 12 = 6 beds. Only 2 beds are empty, so there is **not** enough space.

Answer to Question 10

a. 36 ÷ 4 = **9 marbles**.
b. 36 ÷ 3 = **12 marbles**.
c. 36 − 9 − 12 = **15 marbles**.
d. He got 9 marbles. 9 ÷ 3 = 3 and 2 × 3 = **6 marbles**.

Answer to Question 11

a. 120 ÷ 5 = 24, so **24 pages**.
b. 2 × 24 = **48 pages**.
c. 1 + 2 = 3, so she has read **$\frac{3}{5}$** of the book (72 pages).
d. 120 − 72 = **48 pages** (or $\frac{2}{5}$ of 120 = 48).

Answer to Question 12

a. 3 + 2 = 5, so **$\frac{5}{8}$**.
b. $\frac{8}{8} - \frac{5}{8} = \mathbf{\frac{3}{8}}$.
c. 40 ÷ 8 = 5, and 3 × 5 = **15 m**.
d. 3 × 5 = **15 m**. (Same as Monday, because the fraction is also $\frac{3}{8}$.)

Answer to Question 13

a. 30 ÷ 3 = **10 children**.
b. 30 ÷ 5 = **6 children** chose swimming and 30 ÷ 6 = **5 children** chose tennis.
c. $\frac{1}{3} = \frac{10}{30}$, $\frac{1}{5} = \frac{6}{30}$ and $\frac{1}{6} = \frac{5}{30}$. Add: 10 + 6 + 5 = 21, so **$\frac{21}{30}$** = $\frac{7}{10}$.
d. 30 − 21 = **9 children** chose gymnastics, which is $\frac{9}{30} = \frac{3}{10}$ of the club.

Answer to Question 14

a. Add the numerators and keep the denominator: 3 + 2 = 5, so $\frac{3}{4} + \frac{2}{4} = \frac{5}{4}$, which is 1 $\frac{1}{4}$ as a mixed number. So one batch uses **1 $\frac{1}{4}$** cups altogether.
b. 2 × $\frac{3}{4} = \frac{6}{4}$ = **1 $\frac{2}{4}$** cups (1 $\frac{1}{2}$ cups).
c. 2 × $\frac{2}{4} = \frac{4}{4}$ = **1 cup**.
d. 2 cups = $\frac{8}{4}$. $\frac{8}{4} - \frac{6}{4} = \mathbf{\frac{2}{4}} = \frac{1}{2}$ cup left.

Answer to Question 15

a. 60 ÷ 2 = **30 children**.
b. 60 ÷ 5 = **12 by minibus** and 60 ÷ 4 = **15 by train**.
c. $\frac{1}{2} = \frac{10}{20}$, $\frac{1}{5} = \frac{4}{20}$ and $\frac{1}{4} = \frac{5}{20}$. Add: 10 + 4 + 5 = 19, so $\frac{19}{20}$ travel by vehicle and

$\frac{1}{20}$ walk.

d. 60 ÷ 20 = 3, so **3 children** walk. Check: 60 − 30 − 12 − 15 = 3.
e. $\frac{19}{20}$ is more than $\frac{15}{20}$ (which is $\frac{3}{4}$), so she is **right**.

Answer to Question 16

a. 60 ÷ 4 = **£15**.
b. 60 ÷ 3 = **£20** on the game and 60 ÷ 6 = **£10** on sweets and drinks.
c. 15 + 20 + 10 = **£45**.
d. $\frac{1}{4} = \frac{3}{12}$, $\frac{1}{3} = \frac{4}{12}$ and $\frac{1}{6} = \frac{2}{12}$. Add: 3 + 4 + 2 = 9, so $\frac{9}{12}$ is spent and $\frac{3}{12}$ ($\frac{1}{4}$) is saved.
e. 60 − 45 = **£15**, which is $\frac{1}{4}$ of £60.

Answer to Question 17

a. 240 ÷ 8 = 30, and 3 × 30 = **90 km**.
b. 240 ÷ 4 = **60 km**.
c. $\frac{1}{4} = \frac{2}{8}$. Add: $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$.
d. $\frac{8}{8} - \frac{5}{8} = \frac{3}{8}$ is left. 3 × 30 = **90 km**. Check: 240 − 90 − 60 = 90.
e. 90 ÷ 60 = 1 remainder 30, so it takes **1 hour 30 minutes** (1 $\frac{1}{2}$ hours).

Answer to Question 18

a. 3 + 4 = 7, so $\frac{7}{12}$.
b. 3 + 4 + 2 = 9 sections are done, so 12 − 9 = **3 sections** on Thursday.
c. $\frac{3}{12} = \frac{1}{4}$ (divide the top and bottom by 3).
d. 24 ÷ 3 = 8 children are away, so 24 − 8 = **16 children** are at school.
e. Wednesday: $\frac{2}{12} = \frac{1}{6}$. She is **right**.

Answer to Question 19

a. 48 ÷ 6 = **8 jars**.
b. 48 ÷ 4 = **12 jars** of jellies and 48 ÷ 3 = **16 jars** of toffees.
c. $\frac{1}{6} = \frac{2}{12}$, $\frac{1}{4} = \frac{3}{12}$ and $\frac{1}{3} = \frac{4}{12}$. Add: 2 + 3 + 4 = 9, so $\frac{9}{12} = \frac{3}{4}$.
d. Mints: $\frac{3}{12}$ of 48 = 12 jars. Check: 48 − 8 − 12 − 16 = **12 jars**.
e. 16 ÷ 4 = 4 and 3 × 4 = **12 jars** sold, so 16 − 12 = **4 jars** are left.

Answer to Question 20

a. Three numerators must add to 16 (because 2 wholes = $\frac{16}{8}$). The only possibilities

are: $\frac{3}{8} + \frac{6}{8} + \frac{7}{8}$, $\frac{4}{8} + \frac{5}{8} + \frac{7}{8}$. There are 2 answers.

b. The numerators must differ by 3. Two possible pairs are $\frac{4}{8}$ and $\frac{1}{8}$ ($\frac{4}{8} - \frac{1}{8} = \frac{3}{8}$), and $\frac{7}{8}$ and $\frac{4}{8}$ ($\frac{7}{8} - \frac{4}{8} = \frac{3}{8}$). Others: $\frac{5}{8}$ and $\frac{2}{8}$, $\frac{6}{8}$ and $\frac{3}{8}$.

c. The three fractions must be different, and $\frac{1}{8}$ three times uses the same fraction three times. Also, $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{3}{8}$, which is much less than 2.