Answers - Fractions: equivalent, mixed numbers and improper

Year: Year 5

Answer to Question 1

a. $\frac{2}{3}$: the denominator is multiplied by 4, so multiply the numerator by 4 too: 2 × 4 = 8. $\frac{2}{3} = \frac{8}{12}$.
b. $\frac{7}{8}$: the denominator is multiplied by 3, so multiply the numerator by 3 too: 7 × 3 = 21. $\frac{7}{8} = \frac{21}{24}$.
c. $\frac{3}{5}$: the denominator is multiplied by 4, so multiply the numerator by 4 too: 3 × 4 = 12. $\frac{3}{5} = \frac{12}{20}$.
d. $\frac{5}{6}$: the denominator is multiplied by 3, so multiply the numerator by 3 too: 5 × 3 = 15. $\frac{5}{6} = \frac{15}{18}$.

Answer to Question 2

a. $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$. (Multiply top and bottom by 2, 3, 4.)
b. $\frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \frac{12}{16}$. (Multiply top and bottom by 2, 3, 4.)

Answer to Question 3

a. $\frac{6}{8}$: divide both by 2. $\frac{3}{4}$.
b. $\frac{12}{18}$: divide both by 6. $\frac{2}{3}$.
c. $\frac{15}{25}$: divide both by 5. $\frac{3}{5}$.
d. $\frac{24}{36}$: divide both by 12. $\frac{2}{3}$.
e. $\frac{14}{28}$: divide both by 14. $\frac{1}{2}$.

Answer to Question 4

a. 7 ÷ 4 = 1 remainder 3, so $1\frac{3}{4}$.
b. 11 ÷ 3 = 3 remainder 2, so $3\frac{2}{3}$.
c. 17 ÷ 5 = 3 remainder 2, so $3\frac{2}{5}$.
d. 23 ÷ 6 = 3 remainder 5, so $3\frac{5}{6}$.

Answer to Question 5

a. $2 \times 3 = 6$ and $6 + 1 = 7$, so $\frac{7}{3}$.
b. $3 \times 4 = 12$ and $12 + 3 = 15$, so $\frac{15}{4}$.
c. $4 \times 5 = 20$ and $20 + 2 = 22$, so $\frac{22}{5}$.
d. $5 \times 6 = 30$ and $30 + 5 = 35$, so $\frac{35}{6}$.

Answer to Question 6

a. Eighths: $\frac{6}{8}$ and $\frac{5}{8}$. $\frac{3}{4} > \frac{5}{8}$.
b. Twelfths: $\frac{7}{12}$ and $\frac{8}{12}$. $\frac{7}{12} < \frac{2}{3}$.
c. Tenths: $\frac{8}{10}$ and $\frac{7}{10}$. $\frac{4}{5} > \frac{7}{10}$.
d. Twelfths: $\frac{10}{12}$ and $\frac{11}{12}$. $\frac{5}{6} < \frac{11}{12}$.

Answer to Question 7

a. $\frac{19}{8}$ of a pizza.
b. $19 \div 8 = 2$ remainder 3, so $2\frac{3}{8}$: 2 whole pizzas and 3 more slices.
c. $\frac{1}{4} = \frac{2}{8}$, so **2 slices**.
d. The $\frac{5}{8}$ left over is **5 slices**.

Answer to Question 8

a. $\frac{7}{4} = 1\frac{3}{4}$; $1\frac{1}{2} = \frac{3}{2}$.
b. $\frac{7}{4}$ **m and** $1\frac{3}{4}$ **m** are equal, since both are 1 and 3/4.
c. In quarters: $\frac{7}{4}$, $\frac{6}{4}$, $\frac{5}{4}$, $\frac{7}{4}$. Longest first: $\frac{7}{4}$ **=** $1\frac{3}{4}$**, then** $1\frac{1}{2}$**, then** $\frac{5}{4}$.
d. The longest is $\frac{7}{4}$ m. Half of that is $\frac{7}{8}$, so each half is $\frac{7}{8}$ **m**.

Answer to Question 9

a. Ravi: $\frac{6}{24} = \frac{1}{4}$. Jo: $\frac{8}{24} = \frac{1}{3}$. Lily: $\frac{4}{24} = \frac{1}{6}$.
b. Jo eats the most ($\frac{8}{24}$) and Lily the least ($\frac{4}{24}$).
c. Squares eaten: $6 + 8 + 4 = 18$. Squares left: $24 - 18 = 6$, which is $\frac{6}{24} = \frac{1}{4}$.
d. $8 \div 8 = 1$ and $24 \div 8 = 3$, so $\frac{8}{24} = \frac{1}{3}$.

Answer to Question 10

a. $\frac{5}{4} = 1\frac{1}{4}$; $\frac{7}{3} = 2\frac{1}{3}$; $\frac{9}{2} = 4\frac{1}{2}$.
b. Oats, with $4\frac{1}{2}$ cups.
c. Multiply top and bottom of $\frac{5}{4}$ by 2 to get $\frac{10}{8}$. **Yes**, she is right.
d. $3\frac{1}{2}$ = 3 × 2 + 1 = 7 over 2 = $\frac{7}{2}$.

Answer to Question 11

a. $\frac{13}{4} = 3\frac{1}{4}$; $\frac{10}{3} = 3\frac{1}{3}$.
b. Ben ran $3\frac{1}{2}$ (the most); Amy and Dee both ran $3\frac{1}{4}$ (the least).
c. Fractional parts: $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$. Order: **Amy = Dee ($3\frac{1}{4}$), Cal ($3\frac{1}{3}$), Ben ($3\frac{1}{2}$)**.
d. Cal ran **3 complete laps** (and one third of another).

Answer to Question 12

a. $\frac{3}{4} = \frac{6}{8}$.
b. 6 eighths is more than 5 eighths, so the **red jug** holds more.
c. $\frac{6}{8} - \frac{5}{8} = \frac{1}{8}$ **litre**.
d. $\frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}$ **litres**.

Answer to Question 13

a. $\frac{1}{4} = \frac{2}{8}$.
b. Books: $\frac{3}{8}$ of £24: 24 ÷ 8 = 3, 3 × 3 = **£9**. Savings: $\frac{2}{8}$ of £24 = 2 × 3 = **£6**.
c. $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$, so $\frac{3}{8}$ is left. That is 3 × 3 = **£9**.
d. **Yes**, $\frac{3}{8}$ is more than $\frac{2}{8}$ (£9 against £6).

Answer to Question 14

a. Walk $\frac{12}{24} = \frac{1}{2}$; Bus $\frac{6}{24} = \frac{1}{4}$; Car $\frac{4}{24} = \frac{1}{6}$; Cycle $\frac{2}{24} = \frac{1}{12}$.
b. 12 pupils do not walk: $\frac{12}{24} = \frac{1}{2}$.
c. Walk and bus: $\frac{12}{24} + \frac{6}{24} = \frac{18}{24} = \frac{3}{4}$.
d. $\frac{1}{12}$ is smaller than $\frac{1}{10}$, because twelfths are smaller pieces than tenths. **Smaller**.

Answer to Question 15

a. Asha $\frac{5}{8}$; Ben $\frac{8}{12}$; Cara $\frac{4}{6}$; Dev $\frac{2}{8}$.
b. Ben $\frac{8}{12} = \frac{2}{3}$; Cara $\frac{4}{6} = \frac{2}{3}$; Dev $\frac{2}{8} = \frac{1}{4}$; Asha $\frac{5}{8}$ is already simplified.
c. In twenty-fourths: Dev 6, Asha 15, Ben 16, Cara 16. So **Dev, Asha, then Ben =**

Cara ($\frac{1}{4} < \frac{5}{8} < \frac{2}{3}$).

d. **Ben and Cara** took the most, $\frac{2}{3}$ of a cake each. They are equal because $\frac{8}{12} = \frac{4}{6}$.

e. First cake: 5 + 2 = 7 slices taken out of 8, so $\frac{1}{8}$ is left.

Answer to Question 16

a. $\frac{5}{2} = 2\frac{1}{2}$; $\frac{7}{4} = 1\frac{3}{4}$; $\frac{11}{6} = 1\frac{5}{6}$; $\frac{9}{4} = 2\frac{1}{4}$.

b. $1\frac{1}{3}$**,** $\frac{7}{4}$ **and** $\frac{11}{6}$.

c. The biggest is $2\frac{3}{4}$ and the smallest is $1\frac{1}{3}$.

d. Twelfths: $1\frac{1}{3} = \frac{16}{12}$; $\frac{7}{4} = \frac{21}{12}$; $\frac{11}{6} = \frac{22}{12}$; $\frac{9}{4} = \frac{27}{12}$; $\frac{5}{2} = \frac{30}{12}$; $2\frac{3}{4} = \frac{33}{12}$. Order: $1\frac{1}{3}$**,** $\frac{7}{4}$**,** $\frac{11}{6}$**,** $\frac{9}{4}$**,** $\frac{5}{2}$**,** $2\frac{3}{4}$.

e. **Three**: $\frac{9}{4}$, $\frac{5}{2}$ and $2\frac{3}{4}$.

Answer to Question 17

a. $\frac{47}{12}$ = 47 ÷ 12 = 3 remainder 11, so $3\frac{11}{12}$; $\frac{35}{12}$ = 2 remainder 11, so $2\frac{11}{12}$.

b. $3\frac{5}{6}$ = 3 × 6 + 5 = 23 over 6 = $\frac{23}{6} = \frac{46}{12}$.

c. Twelfths: Friday 47, Saturday 46, Sunday 35. **Friday, Saturday, Sunday** (most to fewest).

d. Saturday: $\frac{46}{12}$ pizzas means **46 slices**.

e. Total twelfths: 47 + 46 + 35 = 128. 128 ÷ 12 = 10 remainder 8, so $10\frac{8}{12} = 10\frac{2}{3}$ pizzas. 12 is more than $10\frac{2}{3}$, so **yes, it is enough**.

Answer to Question 18

a. $\frac{1}{2} = \frac{6}{12}$ and $\frac{3}{4} = \frac{9}{12}$.

b. Between $\frac{6}{12}$ and $\frac{9}{12}$: $\frac{7}{12}$ **and** $\frac{8}{12}$. There are **2** with denominator 12.

c. $\frac{2}{3} = \frac{8}{12}$, which is one of those two. **Yes**.

d. Use twelfths: $\frac{1}{3} = \frac{4}{12}$ and $\frac{1}{2} = \frac{6}{12}$, so $\frac{5}{12}$ lies between them.

e. Change both fractions to a bigger common denominator, such as 24, and there is room for more numerators in between. We can always do this.

Answer to Question 19

a. $\frac{18}{90} = \frac{1}{5}$. (Divide top and bottom by 18.)

b. $\frac{7}{15}$ of 90: 90 ÷ 15 = 6, 6 × 7 = **42 minutes**.

c. Second half: 42 minutes compared with 18 minutes, so the **second half**.

d. $\frac{60}{90} = \frac{2}{3}$.

e. 60 minutes out of 90 is $\frac{2}{3}$, and the other team had 30 minutes, $\frac{30}{90} = \frac{1}{3}$. **Yes**, he is

right.

Answer to Question 20

a. $\frac{12}{18} = \frac{2}{3}$. With denominator 10 or less: $\frac{2}{3}$, $\frac{4}{6}$ **and** $\frac{6}{9}$.
b. If the fraction is $\frac{2k}{5k}$, then 2k + 5k = 35, so 7k = 35 and k = 5. The fraction is $\frac{10}{25}$.
c. 3 = $\frac{21}{7}$ and 4 = $\frac{28}{7}$. The fractions strictly between are $\frac{22}{7}$ **(**$3\frac{1}{7}$**),** $\frac{23}{7}$ **(**$3\frac{2}{7}$**),** $\frac{24}{7}$ **(**$3\frac{3}{7}$**),** $\frac{25}{7}$ **(**$3\frac{4}{7}$**),** $\frac{26}{7}$ **(**$3\frac{5}{7}$**) and** $\frac{27}{7}$ **(**$3\frac{6}{7}$**)**. That is 6 fractions.