Fractions

Helpful Hint

To add and subtract **fractions** with different **denominators**, first write them using the **lowest common multiple** of both **denominators**. This is the smallest number that both **denominators** can divide into.

Example: $2\frac{2}{3} + 1\frac{3}{5} = ?$

First turn the **mixed numbers** into **improper fractions**. Multiply the whole number by the **denominator** and then add the **numerator**.

$2 \times 3 = 6 + 2 = \frac{8}{3}$

$1 \times 5 = 5 + 3 = \frac{8}{5}$

Next find the **lowest common multiples** of 3 and 5 (the **denominators**).

Multiples of 3: 3, 6, 9, 12, **15**, 18, 21, …

Multiples of 5: 5, 10, **15**, 20, …

The **lowest common multiple** of 3 and 5 is **15**, so this is the **common denominator**. Now convert both **fractions** to fifteenths. To do this, multiply the **numerator** and the **denominator**.

3 goes into 15 five times, so multiply the **numerator** and the **denominator** by 5

$8 \times 5 = 40$

$3 \times 5 = 15$

5 goes into 15 three times, so multiply the **numerator** and the **denominator** by 3

$8 \times 3 = 24$

$5 \times 3 = 15$

$\frac{40}{15} + \frac{24}{15} = \frac{64}{15}$

$\frac{64}{15}$ is an **improper fraction**. Divide the **numerator** by the **denominator** to see how many whole numbers ($\frac{15}{15}$) you have.

$64 \div 15 = 4$ r 4. So this gives us $4\frac{4}{15}$.

Ⓐ Answer these questions and write the answers in their simplest form.

1 $\frac{4}{5} - \frac{2}{10} =$ _____ [1]

2 $\frac{3}{9} + \frac{1}{6} =$ _____ [1]

3 $2\frac{2}{3} + 2\frac{5}{6} =$ _____ [1]

4 $\frac{7}{8} - \frac{3}{16} =$ _____ [1]

5 $2\frac{1}{2} + \frac{5}{8} =$ _____ [1]

6 $1\frac{1}{8} + 1\frac{1}{3} =$ _____ [1]

7 $2\frac{1}{6} + \frac{7}{18} =$ _____ [1]

8 $3\frac{2}{5} - \frac{1}{4} =$ _____ [1]

8

Helpful Hint

Remember, to multiply a **fraction** by a whole number, only multiply the **numerator** by the whole number.

Example: $3 \times \frac{3}{10}$ is 3 × 3 tenths, this is 9 tenths or $\frac{9}{10}$

When multiplying with **mixed numbers**, turn the **mixed number** into an **improper fraction** first.

Example: $2\frac{4}{9}$ **Step 1** Multiply the whole number by the **denominator** (2 × 9 =18)

Step 2 Add the result to the **numerator** (18 + 4 = 22)

Step 3 Replace the **numerator** with the result ($2\frac{4}{9}$ becomes $\frac{22}{9}$)

Then use this to complete the multiplication. Look out for chances to make simpler **equivalent fractions** (here 22 and 11 are **multiples** of 11 and simplify to 2 and 1).

$2\frac{4}{9} \times \frac{5}{11} = \frac{22}{9} \times \frac{5}{11} = \frac{22 \times 5}{9 \times 11} = \frac{2 \times 5}{9 \times 1} = \frac{10}{9} = 1\frac{1}{9}$

If your answer is an **improper fraction**, make sure you convert it to a **mixed number**.

Example: $\frac{3}{4} \times 5 = \frac{15}{4}$

$15 \div 4 = 3$ r 3 so $\frac{15}{4} = 3\frac{3}{4}$

When multiplying pairs of **fractions**, multiply the **numerators** and then multiply the **denominators**.

Example: $\frac{2}{7} \times \frac{3}{4} = \frac{2 \times 3}{7 \times 4} = \frac{6}{28} = \frac{3}{14}$

(B) Answer these questions and write the answers in their simplest form. Show your workings out.

1 $\frac{3}{5} \times \frac{1}{3} =$

[1]

2 $\frac{5}{6} \times \frac{3}{5} =$

[1]

3 $\frac{2}{3} \times 2\frac{1}{4} =$

[1]

4 $4 \times \frac{2}{3} =$

[1]

4

Helpful Hint

To divide **fractions** by whole numbers, multiply the **denominator** by the whole number.

Example: $\frac{1}{5} \div 4 = \frac{1}{20}$

$\frac{1}{5 \times 4} = \frac{1}{20}$

To divide a **fraction** by another **fraction**, turn the **fraction** you are dividing by upside down and multiply.

Example: $\frac{4}{5} \div \frac{3}{4} = 1\frac{1}{15}$

Turn $\frac{3}{4}$ upside down and multiply:

$\frac{4 \times 4}{5 \times 3} = \frac{16}{15}$

Remember to turn **improper fractions** into **mixed numbers** ($\frac{16}{15}$ becomes $1\frac{1}{15}$).

(c) Answer these questions and write the answers in their simplest form. Show your workings out.

1 $\frac{1}{4} \div 4 =$

[1]

2 $\frac{4}{5} \div 6 =$

[1]

3 $\frac{2}{5} \div \frac{3}{4} =$

[1]

4 $\frac{5}{8} \div \frac{15}{64} =$

[1]

5 $\frac{2}{3} \div \frac{14}{39} =$

[1]

5

Word problems

(D) Solve these word problems and show your workings out.

1 Maddie's book has 50 pages. In one night she read $\frac{3}{5}$ of it.
How many pages had she read?

[1]

2 At a picnic 6 children ate two and a half sandwiches each.
How many sandwiches were eaten in total?

[1]

3 A gardener had 36 bulbs to plant. He planted $\frac{5}{6}$ of them in the first hour.
How many bulbs did he still need to plant?

[1]

4 A cake was cut into 12 slices. On the first day $\frac{1}{3}$ of the cake was eaten;
the following day $\frac{1}{4}$ of the whole cake was eaten.
How many slices were eaten over the two days?

[1]

5 I have made 12 large cakes. I want to give my friends $\frac{2}{3}$ of a cake each.
How many friends can have some cake?

[1]

5

Answers

Unit 6 Fractions

A

1	$\frac{3}{5}$	**5**	$3\frac{1}{8}$
2	$\frac{1}{2}$	**6**	$2\frac{11}{24}$
3	$5\frac{1}{2}$	**7**	$2\frac{5}{9}$
4	$\frac{11}{16}$	**8**	$3\frac{3}{20}$

B

1	$\frac{1}{5}$	**3**	$1\frac{1}{2}$
2	$\frac{1}{2}$	**4**	$2\frac{2}{3}$

C

1	$\frac{1}{16}$	**4**	$2\frac{2}{3}$
2	$\frac{2}{15}$	**5**	$1\frac{6}{7}$
3	$\frac{8}{15}$		

Word problems

D

1 30 pages
2 15 sandwiches
3 6 bulbs
4 7 slices
5 18 friends