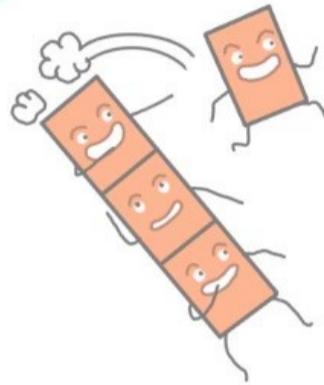
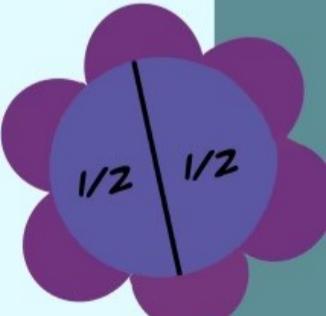
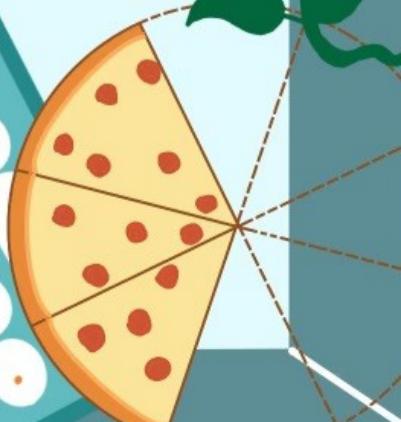
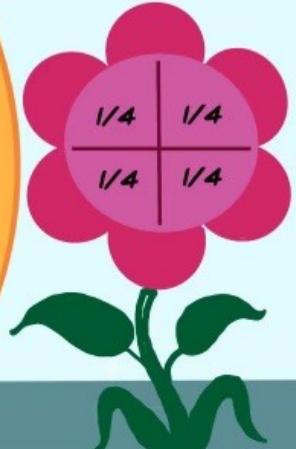
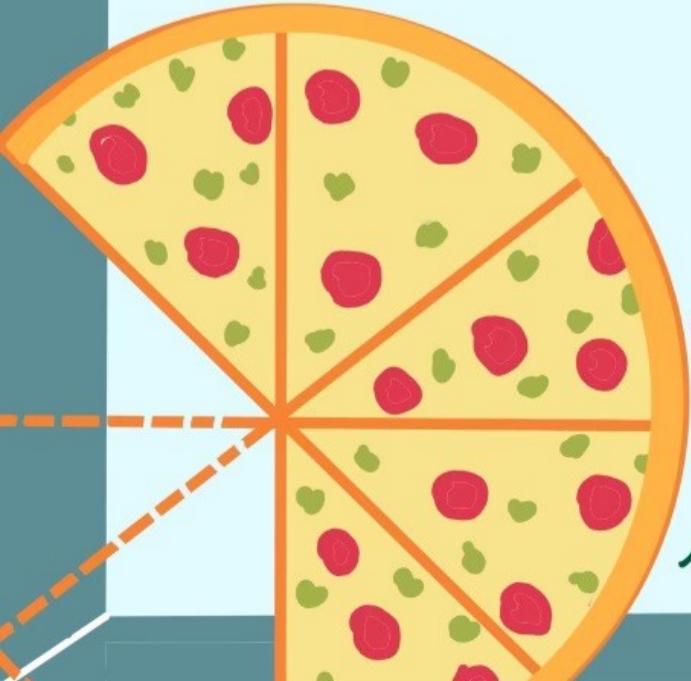
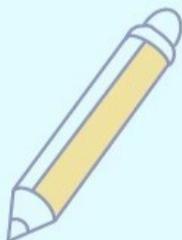
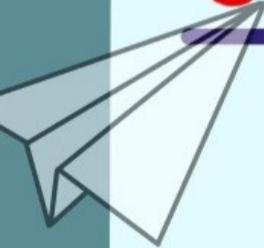


$\frac{4}{16}$   
 $\frac{8}{12}$



# Fraction



## Question 1

Without using a calculator, work out  $\frac{5}{6} - \frac{1}{2}$

Show all the steps of your working and give your answer as a fraction in its simplest form. [2]

$$\frac{5}{6} - \frac{1}{2} \times \frac{3}{3} = \frac{5}{6} - \frac{3}{6} = \frac{2}{6} = \frac{1}{3}$$

## Question 2

Work out  $\frac{2}{3} - \frac{1}{4}$ , giving your answer as a fraction in its lowest terms.

Do not use a calculator and show all the steps of your working. [2]

$$\frac{2}{3} \times \frac{4}{4} - \frac{1}{4} \times \frac{3}{3} = \frac{8}{12} - \frac{3}{12} = \frac{5}{12}$$

## Question 3

Without using your calculator, work out  $\frac{3}{4} + \frac{2}{3} - \frac{1}{8}$ .

You must show all your working and give your answer as a mixed number in its simplest form. [4]

$$\frac{8 \times 6}{4 \times 6} + \frac{2 \times 8}{3 \times 8} - \frac{1 \times 3}{8 \times 3} = \frac{18}{24} + \frac{16}{24} - \frac{3}{24} = \frac{31}{24} = 1 \frac{7}{24}$$

## Question 4

Without using a calculator, work out  $\frac{3}{5} + \frac{1}{6}$ .

[2]

Write down all the steps of your working and give your answer as a fraction in its simplest form.

$$\frac{3 \times 6}{5 \times 6} + \frac{1 \times 5}{6 \times 5} = \frac{18}{30} + \frac{5}{30} = \frac{23}{30}$$

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## Question 5

Without using a calculator, work out  $2\frac{5}{8} \times \frac{3}{7}$ .

Show all your working and give your answer as a mixed number in its lowest terms.

[3]

$$\cancel{\frac{21}{8}}^3 \times \frac{3}{\cancel{7}}_1 = \frac{9}{8} = 1\frac{1}{8}$$

## Question 6

Without using a calculator, work out  $\frac{1}{12} \times 1\frac{1}{5}$ .

Show all your working and give your answer as a fraction in its lowest terms.

[2]

$$\cancel{\frac{1}{12}}_2 \times \frac{\cancel{6}_1}{5} = \frac{1}{10}$$

## Question 7

Without using your calculator, work out  $1\frac{7}{12} + \frac{13}{20}$

You must show all your working and give your answer as a mixed number in its simplest form.

[3]

$$\cancel{\frac{19 \times 5}{12 \times 5}} + \frac{\cancel{13 \times 3}}{20 \times 3} = \frac{95}{60} + \frac{39}{60} = \frac{134}{60} = \frac{67}{30} = 2\frac{7}{30}$$

### Question 8

Without using your calculator, work out  $2\frac{1}{4} - \frac{11}{12}$ .

[3]

You must show all your working and give your answer as a fraction in its lowest terms.

$$\frac{9 \cancel{\times 3}}{4 \cancel{\times 3}} - \frac{11}{12} = \frac{27}{12} - \frac{11}{12} = \frac{16}{12} = \frac{4}{3} = 1\frac{1}{3}$$

### Question 9

Calculate  $\frac{2.07 - 1.89}{5.71 - 3.92}$ .

[1]

$$\frac{0.18 \cancel{\times 100}}{1.79 \cancel{\times 100}} = \frac{18}{179}$$

### Question 10

Write the following as single fractions.

(a)  $x + \frac{x}{2}$

[1]

$$\frac{3x}{2}$$

(b)  $x + \frac{2}{x}$

[1]

$$\frac{x^2 + 2}{x}$$

### Question 11

Work out  $\frac{2}{3} + \frac{1}{6} - \frac{1}{4}$ , giving your answer as a fraction in its lowest terms.

[3]

Do not use a calculator and show all the steps of your working.

$$\frac{2 \times 4}{3 \times 4} + \frac{1 \times 2}{6 \times 2} - \frac{1 \times 3}{4 \times 3} = \frac{8}{12} + \frac{2}{12} - \frac{3}{12} = \frac{7}{12}$$

### Question 12

Without using a calculator, work out  $1\frac{4}{5} \div \frac{3}{7}$ .

Show all your working and give your answer as a fraction in its lowest terms.

[3]

$$\frac{9}{5} \div \frac{3}{7} = \frac{9}{5} \times \frac{7}{3} = \frac{21}{5} = 4\frac{1}{5}$$

### Question 13

Without using a calculator, work out  $\frac{4}{5} \div 2\frac{2}{3}$

Write down all the steps of your working and give your answer as a fraction in its simplest form.

$$\frac{4}{5} \div \frac{8}{3} = \frac{4}{5} \times \frac{3}{8} = \frac{3}{10}$$

[3]

### Question 1

Without using a calculator, work out  $1\frac{7}{8} \div \frac{5}{9}$

Show all your working and give your answer as a fraction in its lowest terms.

[3]

$$\frac{15}{8} \div \frac{5}{9} = \frac{\cancel{15}^3}{8} \times \frac{9}{\cancel{5}^1} = \frac{27}{8} = 3\frac{3}{8}$$

### Question 2

Without using your calculator, work out  $2\frac{7}{9} \div \frac{5}{6}$ .

[4]

Give your answer as a fraction in its lowest terms.

You must show each step of your working.

$$\frac{25}{9} \div \frac{5}{6} = \frac{25}{9} \times \frac{6^2}{5^1} = \frac{60}{3} = 3\frac{1}{3}$$

### Question 3

Without using a calculator, work out  $\frac{1}{4} + \frac{1}{6}$ .

Write down all the steps in your working and give your answer as a fraction in its simplest form.

[2]

$$\frac{1 \times 3}{4 \times 3} + \frac{1 \times 2}{6 \times 2} = \frac{3}{12} + \frac{2}{12} = \frac{5}{12}$$

#### Question 4

Without using a calculator, work out  $1\frac{1}{6} \div \frac{7}{8}$ .

[3]

Show all your working and give your answer as a fraction in its lowest terms.

$$\frac{7}{6} \div \frac{7}{8} = \frac{\cancel{7}^1}{\cancel{6}^3} \times \frac{\cancel{8}^4}{\cancel{7}^1} = \frac{4}{3}$$

#### Question 5

Without using your calculator, work out  $\frac{5}{6} - \left(\frac{1}{2} \times 1\frac{1}{2}\right)$ .

Write down all the steps of your working.

[3]

$$\frac{5}{6} - \left(\frac{1}{2} \times \frac{3}{2}\right) = \frac{5 \times 2}{6 \times 2} - \frac{3 \times 3}{4 \times 3} = \frac{10}{12} - \frac{9}{12} = \frac{1}{12}$$

#### Question 6

Without using a calculator, work out  $1\frac{1}{4} - \frac{7}{9}$ .

[3]

Write down all the steps in your working.

$$\frac{5 \times 9}{4 \times 9} - \frac{7 \times 4}{9 \times 4} = \frac{45}{36} - \frac{28}{36} = \frac{17}{36}$$

#### Question 7

Show that  $1\frac{1}{2} \div \frac{3}{16} = 8$ .

[2]

Do not use a calculator and show all the steps of your working.

$$\frac{3}{2} \div \frac{3}{16} = \frac{1}{\cancel{2}} \times \frac{\cancel{8}^4}{\cancel{3}^1} = 8$$

## Question 8

Do not use a calculator in this question and show all the steps of your working.

Give each answer as a fraction in its lowest terms.

Work out.

$$(a) \frac{3}{4} - \frac{1}{12} \quad [2]$$

$$\frac{\cancel{3}^1 \times \cancel{3}^1}{\cancel{4}^1 \times \cancel{3}^1} - \frac{1}{12} = \frac{9}{12} - \frac{1}{12} = \frac{8}{12} = \frac{2}{3}$$

$$(b) 2\frac{1}{2} \times \frac{4}{25} \quad [2]$$

$$1\frac{\cancel{5}^1}{\cancel{2}^1} \times \frac{\cancel{2}^1 \cancel{4}^2}{\cancel{5}^1 \cancel{25}^5} = \frac{2}{5}$$

## Question 9

Without using a calculator, work out  $\frac{6}{7} \div 1\frac{2}{3}$ .

Write down all the steps in your working. [3]

$$\frac{6}{7} \div \frac{5}{3} = \frac{6}{7} \times \frac{3}{5} = \frac{18}{35}$$

## Question 10

Write down all your working to show that the following statement is correct. [2]

$$\frac{1 + \frac{8}{9}}{2 + \frac{1}{2}} = \frac{34}{45}$$

$$1 + \frac{8}{9} = \frac{9}{9} + \frac{8}{9} = \frac{17}{9}$$

$$2 + \frac{1}{2} = \frac{4}{2} + \frac{1}{2} = \frac{5}{2}$$

$$\frac{\frac{17}{9}}{\frac{5}{2}} = \frac{17}{9} \times \frac{2}{5} = \frac{34}{45}$$

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### Question 11

Show that  $\left(\frac{1}{10}\right)^2 + \left(\frac{2}{5}\right)^2 = 0.17$ .

[2]

Write down all the steps in your working.

$$\frac{1}{100} + \frac{4}{25} = 0.01 + 0.16 = 0.17$$

### Question 12

Without using your calculator, work out  $1\frac{5}{6} + \frac{9}{10}$

You must show your working and give your answer as a mixed number in its simplest form.

[3]

$$\begin{aligned} \frac{11 \times 5}{6 \times 5} + \frac{9 \times 3}{6 \times 3} &= \frac{55}{30} + \frac{27}{30} = \frac{82}{30} = \frac{41}{15} \\ &= 2\frac{11}{15} \end{aligned}$$

### Question 13

$$1\frac{1}{2} + \frac{1}{3} + \frac{1}{4} = \frac{p}{12}$$

Work out the value of  $p$ .

Show all your working.

[2]

$$\begin{aligned} \frac{3 \times 6}{2 \times 6} + \frac{1 \times 4}{3 \times 4} + \frac{1 \times 3}{4 \times 3} &= \frac{18}{12} + \frac{4}{12} + \frac{3}{12} = \frac{25}{12} = \frac{p}{12} \\ \therefore p &= 25 \end{aligned}$$

## Question 1

Without using your calculator, work out the following.

Show all the steps of your working and give each answer as a fraction in its simplest form.

(a)  $\frac{11}{12} - \frac{1}{3}$  [2]

$$\frac{11}{12} - \frac{1}{3} \times \frac{4}{4} = \frac{11}{12} - \frac{4}{12} = \frac{7}{12}$$

(b)  $\frac{1}{4} \div \frac{11}{13}$  [2]

$$\frac{1}{4} \times \frac{13}{11} = \frac{13}{44}$$

## Question 2

Write down all the working to show that

$$\frac{\frac{3+2}{5+3}}{\frac{3 \times 2}{5 \times 3}} = 3\frac{1}{6}$$

[3]

$$\frac{\cancel{3} \times 3}{\cancel{5} \times 3} + \frac{\cancel{2} \times 5}{\cancel{3} \times 5} = \frac{9}{15} + \frac{10}{15} = \frac{19}{15}$$

$$\cancel{\frac{19}{15}} \times \frac{2}{\cancel{3}} = \frac{2}{5}$$

$$\frac{19}{15} \div \frac{2}{5} = \frac{19}{15} \times \frac{5}{2} = \frac{19}{6} = 3\frac{1}{6}$$

## Question 3

Jiwan incorrectly wrote  $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} = 1\frac{3}{9}$ . [3]

Show the correct working and write down the answer as a mixed number.

$$\frac{\cancel{1} \times 12}{\cancel{1} \times 12} + \frac{\cancel{1} \times 6}{\cancel{2} \times 6} + \frac{\cancel{1} \times 4}{\cancel{3} \times 4} + \frac{\cancel{1} \times 3}{\cancel{4} \times 3} = \frac{12}{12} + \frac{6}{12} + \frac{4}{12} + \frac{3}{12} = \frac{25}{12} = 2\frac{1}{12}$$

## Question 4

Show that  $3^{-2} + 2^{-2} = \frac{13}{36}$ . [2]

Write down all the steps of your working.

$$\frac{1}{3^2} + \frac{1}{2^2} = \frac{1}{9} + \frac{1}{4} = \frac{4}{36} + \frac{9}{36} = \frac{13}{36}$$

## Question 5

Show that  $1\frac{5}{9} \div 1\frac{7}{9} = \frac{7}{8}$ .

[2]

Write down all the steps in your working.

$$1\frac{5}{9} \div 1\frac{7}{9} = \frac{14}{9} \times \frac{9}{16} = \frac{7}{8}$$

## Question 6

(a) Find the value of  $x$  when  $\frac{18}{24} = \frac{27}{x}$ . [1]

$$\frac{18}{24} = \frac{27}{x}$$
  
$$12 = 36$$

(b) Show that  $\frac{2}{3} \div 1\frac{1}{6} = \frac{4}{7}$ . [2]

Write down all the steps in your working.

$$\frac{2}{3} \div \frac{7}{6} = \frac{2}{3} \times \frac{6}{7} = \frac{4}{7}$$

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### Question 7

Show that  $\frac{7}{27} + 1\frac{7}{9} = 2\frac{1}{27}$ . [2]

Write down all the steps in your working.

$$\frac{7}{27} + \frac{16 \times 3}{9 \times 3} = \frac{7}{27} + \frac{48}{27} = \frac{55}{27} = 2\frac{1}{27}$$

### Question 8

Write down the number which is 3.6 less than -4.7. [1]

$$-4.7 - 3.6 = -8.3$$

### Question 9

Show that  $3\frac{3}{4} + 1\frac{1}{3} = 5\frac{1}{12}$ . [2]

Write down all the steps in your working.

$$\frac{15 \times 3}{4 \times 3} + \frac{4 \times 4}{3 \times 4} = \frac{15}{12} + \frac{16}{12} = \frac{61}{12} = 5\frac{1}{12}$$

### Question 10

Write as a single fraction  $\frac{3a}{8} + \frac{4}{5}$ . [2]

$$\frac{3a}{8} \times 5 + \frac{4}{5} \times 8 = \frac{15a}{40} + \frac{32}{40} = \frac{15a + 32}{40}$$

### Question 11

(a)  $\frac{2}{3} + \frac{5}{6} = \frac{x}{2}$

[1]

Find the value of  $x$ .

$$\frac{2 \times 4}{3 \times 4} + \frac{5 \times 2}{6 \times 2} = \frac{8}{12} + \frac{10}{12} = \frac{18}{12} = \frac{3}{2} \Rightarrow x = 3$$

(b)

$$\frac{5}{3} \div \frac{3}{y} = \frac{40}{9}$$

[1]

Find the value of  $y$ .

$$\frac{5}{3} \times \frac{y}{3} = \frac{5y}{9} = \frac{40}{9}$$

$$5y = 40$$

$$y = 8$$

### Question 12

Work out the value of

$$\begin{array}{r} -\frac{1}{2} - \frac{3}{8} \\ \hline -\frac{1}{2} + \frac{3}{8} \end{array}$$

[2]

$$-\frac{1}{2} - \frac{3}{8} = -\frac{4}{8} - \frac{3}{8} = -\frac{7}{8}$$

$$\begin{aligned} -\frac{7}{8} &\div (-\frac{1}{8}) \\ &= -\frac{7}{8} \times (-8) = 7 \end{aligned}$$

$$-\frac{1}{2} + \frac{3}{8} = -\frac{4}{8} + \frac{3}{8} = -\frac{1}{8}$$

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## Question 1

Without using a calculator, work out  $1\frac{2}{3} - \frac{11}{15}$ .

Write down all the steps of your working and give your answer as a fraction in its lowest terms. [3]

$$\frac{5 \times 5}{3 \times 5} - \frac{11}{15} = \frac{25}{15} - \frac{11}{15} = \frac{14}{15}$$

## Question 2

(a) Write  $\frac{11}{3}$  as a mixed number.

[1]

$$3 \frac{2}{3}$$

(b) Without using a calculator, work out  $\frac{1}{4} + \frac{5}{12}$ .

Show all the steps of your working and give your answer as a fraction in its lowest terms. [2]

$$\frac{1 \times 3}{4 \times 3} + \frac{5}{12} = \frac{3}{12} + \frac{5}{12} = \frac{8}{12} = \frac{2}{3}$$

## Question 3

Without using a calculator, work out  $1\frac{2}{3} + \frac{5}{7}$ .

[3]

Write down all the steps of your working and give your answer as a mixed number in its simplest form.

$$\frac{5 \times 7}{3 \times 7} + \frac{5 \times 3}{7 \times 3} = \frac{35}{21} + \frac{15}{21} = \frac{50}{21} = 2\frac{8}{21}$$

## Question 4

Without using your calculator, work out  $\frac{11}{12} - \left(\frac{3}{4} - \frac{2}{3}\right)$ .

[4]

You must show all your working and give your answer as a fraction in its simplest form.

$$\frac{\cancel{3}x\cancel{3}}{\cancel{4}x\cancel{3}} - \frac{2x4}{3x4} = \frac{9}{12} - \frac{8}{12} = \frac{1}{12}$$

$$\frac{1}{2} - \frac{1}{12} = \frac{6}{12} = \frac{5}{6}$$

## Question 5

Without using your calculator, work out  $3\frac{1}{3} \div 2\frac{1}{2}$ .

You must show all your working and give your answer as a mixed number in its simplest form.

[3]

$$\frac{10}{3} \div \frac{5}{2} = \frac{\cancel{10}^2}{3} \times \frac{2}{\cancel{5}_1} = \frac{4}{3} = 1\frac{1}{3}$$

## Question 6

Without using a calculator, work out  $\frac{6}{7} \div 1\frac{2}{3}$ .

Show all your working and give your answer as a fraction in its lowest terms.

[3]

$$\frac{6}{7} \div \frac{5}{3} = \frac{6}{7} \times \frac{3}{5} = \frac{18}{35}$$

## Question 7

Without using a calculator, show that  $\left(\frac{49}{16}\right)^{-\frac{3}{2}} = \frac{64}{343}$ .

[2]

Write down all the steps in your working.

$$\left(\frac{16}{49}\right)^{\frac{3}{2}} = \left(\frac{4^2}{7^2}\right)^{\frac{3}{2}} = \left(\frac{4}{7}\right)^3 = \frac{64}{343}$$

## Question 8

Write  $\frac{1}{c} + \frac{1}{d} - \frac{c-d}{cd}$  as a single fraction in its simplest form.

[3]

$$\begin{aligned} \frac{1 \cancel{cd}}{c \cancel{cd}} + \frac{1 \cancel{cd}}{d \cancel{cd}} - \frac{c-d}{cd} &= \frac{d}{cd} + \frac{c}{cd} - \frac{c-d}{cd} = \frac{d+c-c+d}{cd} \\ &= \frac{2d}{cd} = \frac{2}{c} \end{aligned}$$

## Question 9

Work out the value of  $1 + \frac{2}{3 + \frac{4}{5+6}}$ .

[2]

$$\begin{aligned} \frac{4}{5+6} &= \frac{4}{11} & 3 + \frac{4}{11} &= \frac{33}{11} + \frac{4}{11} = \frac{37}{11} \\ 2 \div \frac{37}{11} &= 2 \times \frac{11}{37} = \frac{22}{37} & 1 + \frac{22}{37} &= \frac{37}{37} + \frac{22}{37} = \frac{59}{37} \\ &&&= 1 \frac{22}{37} \end{aligned}$$

## Question 10

$$\frac{4c}{5} - \frac{3c}{35} = \frac{10}{7}. \quad \text{Find } c.$$

[2]

$$\frac{4c}{5} - \frac{3c}{35} = \frac{28c}{35} - \frac{3c}{35} = \frac{25c}{35} = \frac{5c}{7} = \frac{10}{7}$$

$$\begin{aligned} 5c &= 10 \\ c &= 2 \end{aligned}$$

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