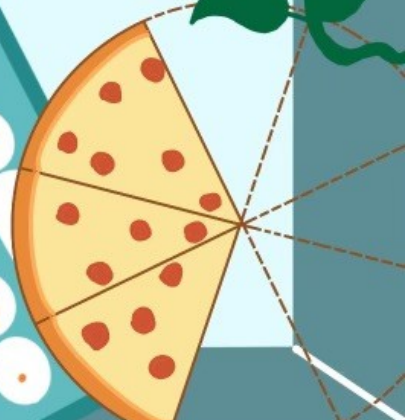
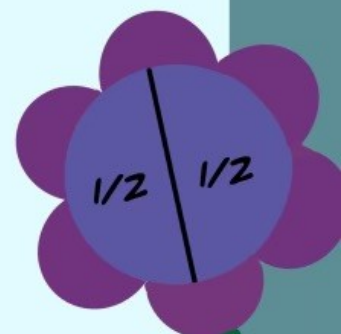
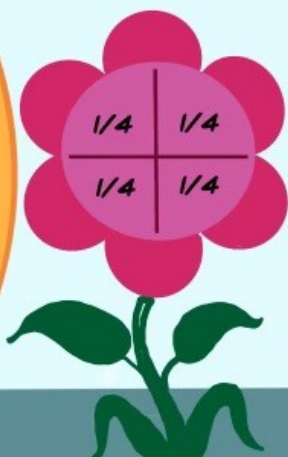
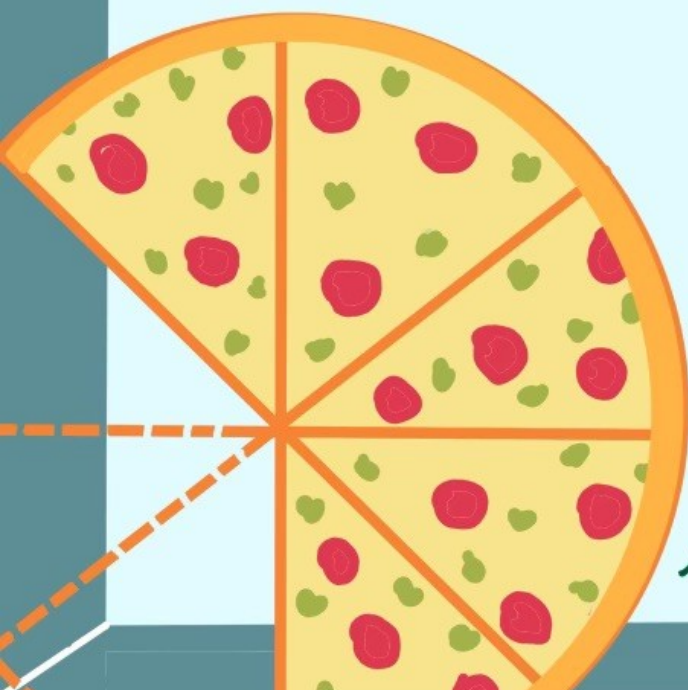
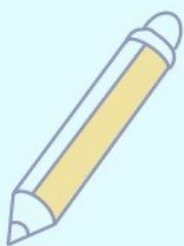
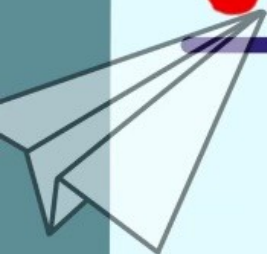


Fraction



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]

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

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.

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

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]

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

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]

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

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]

$$\frac{14 \times 5}{12 \times 5} + \frac{13 \times 3}{20 \times 3} = \frac{95}{60} + \frac{39}{60} = \frac{134}{60} = \frac{67}{30} = 2\frac{7}{30}$$

Question 8

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

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

[3]

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

Question 9

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

[1]

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

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]

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

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 $2\frac{7}{9} \div \frac{5}{6}$.

Give your answer as a fraction in its lowest terms.
You must show each step of your working.

[4]

$$\frac{25}{9} \div \frac{5}{6} = \frac{\cancel{25}^5}{9 \times 3} \times \frac{\cancel{6}^2}{\cancel{5}_1} = \frac{10}{3} = 3\frac{1}{3}$$

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.

$$\frac{3}{2} \div \frac{3}{16} = \frac{\cancel{3}}{\cancel{2}_1} \times \frac{\cancel{16}^8}{\cancel{3}_1} = 8$$

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

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

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

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

Question 9

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

Write down all the steps in your working.

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

Question 10

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

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

$$1 + \frac{8}{9} = \frac{9}{9} + \frac{8}{9} = \frac{17}{9}$$
$$2 + \frac{1}{2} = \frac{4}{2} + \frac{1}{2} = \frac{5}{2}$$

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

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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]

$$\frac{11 \times 5}{6 \times 5} + \frac{9 \times 3}{10 \times 3} = \frac{55}{30} + \frac{27}{30} = \frac{82}{30} = \frac{41}{15} = 2\frac{11}{15}$$

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]

$$\frac{3 \times 6}{2 \times 6} + \frac{1 \times 4}{3 \times 4} + \frac{1 \times 3}{4 \times 3} = \frac{18}{12} + \frac{4}{12} + \frac{3}{12} = \frac{25}{12} = \frac{p}{12}$$

$$\therefore p = 25$$

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]

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

(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

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

[3]

$$\frac{\frac{3 \times 3}{5 \times 3} + \frac{2 \times 5}{3 \times 5}}{\frac{3 \times 2}{5 \times 3}} = \frac{\frac{9}{15} + \frac{10}{15}}{\frac{6}{15}}$$

$$\frac{\cancel{15}^9 \times \cancel{15}^2}{\cancel{15}^6} = \frac{9}{2}$$

$$\frac{9}{15} \div \frac{2}{5} = \frac{9}{15} \times \frac{5}{2} = \frac{9}{3} = 3\frac{1}{6}$$

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.

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

Question 4

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

Write down all the steps of your working.

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

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.

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

Question 6

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

$$\frac{12 \cancel{18}}{\cancel{24}} = \frac{27 \cancel{3}}{x}$$
$$x = 36$$

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

Write down all the steps in your working.

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

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.

$$\frac{15 \times 3}{4 \times 3} + \frac{4 \times 4}{3 \times 4} = \frac{45}{12} + \frac{16}{12} = \frac{61}{12} = 5\frac{1}{12}$$

Question 10

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

[2]

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

Question 11

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

[1]

Find the value of x.

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

$$x = 3$$

(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

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

[2]

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

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

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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.

$$\frac{\overset{3 \times 3}{\cancel{4}^{\cancel{3}}}}{\underset{\cancel{3}}{4}} - \frac{\overset{2 \times 4}{\cancel{3}^{\cancel{2}}}}{\underset{\cancel{4}}{3}} = \frac{9}{12} - \frac{8}{12} = \frac{1}{12}$$
$$\frac{11}{12} - \frac{1}{12} = \frac{10}{12} = \frac{5}{6}$$

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]

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

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]

$$\frac{1 \times d}{c \times d} + \frac{1 \times c}{d \times c} - \frac{c-d}{cd} = \frac{d}{cd} + \frac{c}{cd} - \frac{c-d}{cd} = \frac{d+c-c+d}{cd} = \frac{2d}{cd} = \frac{2}{c}$$

Question 9

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

[2]

$$\frac{4}{5+6} = \frac{4}{11} \quad 3 + \frac{4}{11} = \frac{33}{11} + \frac{4}{11} = \frac{37}{11}$$

$$2 \div \frac{37}{11} = 2 \times \frac{11}{37} = \frac{22}{37}$$

$$1 + \frac{22}{37} = \frac{37}{37} + \frac{22}{37} = \frac{59}{37} = 1 \frac{22}{37}$$

Question 10

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

[2]

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

$$5c = 10 \\ c = 2$$

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