

Formal Written Methods for Calculations

To prepare the year 6 children for the new arithmetic SATs test, we will be sending home weekly homework to allow them to practise their arithmetic skills.

This information sheet provides you with the formal written methods we will be using in school.

Please allow your child to refer to this information sheet when completing their homework as we would like to see their working out when answering each question.

Please keep this sheet available to support your child with their weekly homework.

Addition

$$\begin{array}{r}
 \text{H T U} \\
 7 \ 8 \ 9 \\
 6 \ 4 \ 2 \ + \\
 \hline
 1 \ 4 \ 3 \ 1 \\
 \hline
 \end{array}$$

Answer: 1431

Subtraction

$$\begin{array}{r}
 \text{H T U} \\
 8 \quad 12 \quad 1 \\
 9 \ 3 \ 2 \\
 \hline
 4 \ 5 \ 7 \ - \\
 \hline
 4 \ 7 \ 5
 \end{array}$$

Answer: 475

Multiplication

Short Multiplication

$$\begin{array}{r}
 \text{Th H T U} \\
 2 \ 7 \ 4 \ 1 \\
 \ 6 \ \times \\
 \hline
 1 \ 6 \ 4 \ 4 \ 6 \\
 \hline
 \end{array}$$

Answer: 16 446

Long Multiplication

$$\begin{array}{r}
 \text{Th H T U} \\
 2 \ 8 \ 6 \\
 \ 2 \ 9 \ \times \\
 \hline
 2 \ 5 \ 7 \ 4 \\
 \ 5 \ 7 \ 2 \ 0 \\
 \hline
 8 \ 2 \ 9 \ 4 \\
 \hline
 \end{array}$$

Answer: 8294

Division

Short Division

$$\begin{array}{r}
 4 \ 5 \ \text{r} \ 1 \\
 1 \ 1 \overline{) 4 \ 9 \ 6} \\
 \underline{4 \ 5} \\
 1 \ 4 \\
 \underline{1 \ 1} \\
 3 \ 6 \\
 \underline{3 \ 5} \\
 1 \\
 \underline{1 \ 0} \\
 6
 \end{array}$$

Answer: 45 $\frac{1}{11}$

11
22
33
44
55
66
77
88
99
110
121

Long Division

$$\begin{array}{r}
 2 \ 8 \ \text{r} \ 12 \\
 1 \ 5 \overline{) 4 \ 3 \ 2} \\
 \underline{3 \ 0} \\
 1 \ 3 \ 2 \\
 \underline{1 \ 2 \ 0} \\
 1 \ 2
 \end{array}$$

Answer: 15 $\frac{12}{15}$ or 15 $\frac{4}{5}$

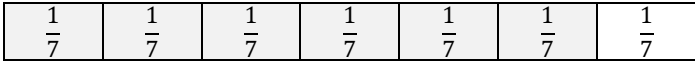
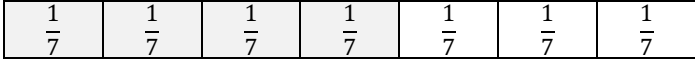
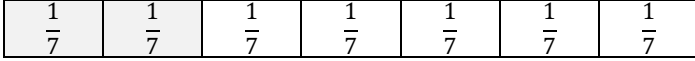
15
30
45
60
75
90
105
120
135
150
165
180

Methods for Calculating with Fractions

Adding Fractions

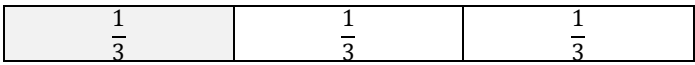
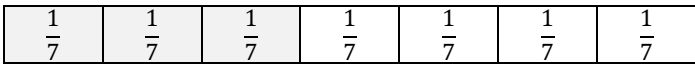
Adding fractions with the same denominator

$$\frac{2}{7} + \frac{4}{7} = \frac{6}{7}$$

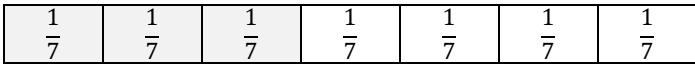


Adding fractions with different denominators

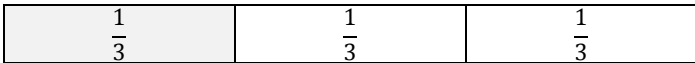
$$\frac{3}{7} + \frac{1}{3} =$$



- We cannot add these fractions together, as they are, because the sizes of the parts (denominators) are different.
- We have to convert the fractions so that they have the same denominator.
- We must find a denominator where 7 and 3 are factors eg 21 and convert each of the fractions.



$$\frac{3}{7} = \frac{9}{21}$$



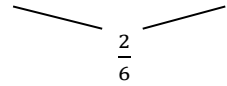
$$\frac{1}{3} = \frac{7}{21}$$

$$\frac{9}{21} + \frac{7}{21} = \frac{16}{21}$$

Subtracting Fractions

Subtracting fractions with the same denominator

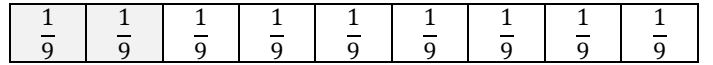
$$\frac{5}{6} - \frac{2}{6} = \frac{3}{6}$$



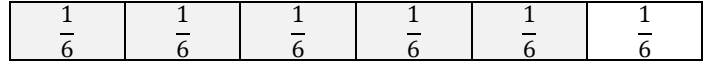
If you take away $\frac{2}{6}$, you are left with $\frac{3}{6}$.

Subtracting fractions with different denominators

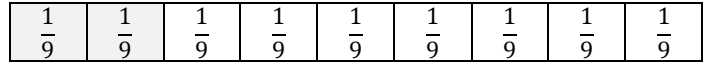
$$\frac{5}{6} - \frac{2}{9} =$$



- We cannot add these fractions together, as they are, because the sizes of the parts (denominators) are different.
- We have to convert the fractions so that they have the same denominator.
- We must find a denominator where 8 and 4 are factors eg 21 and convert each of the fractions.



$$\frac{5}{6} = \frac{15}{18}$$



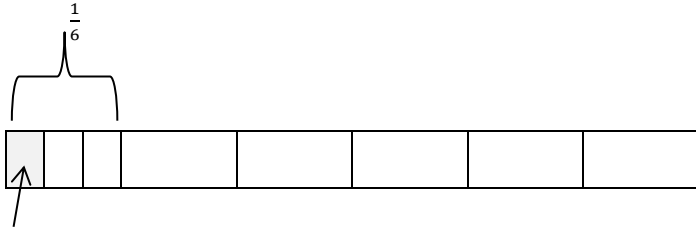
$$\frac{2}{9} = \frac{4}{18}$$

$$\frac{15}{18} - \frac{4}{18} = \frac{11}{18}$$

Multiplying Fractions

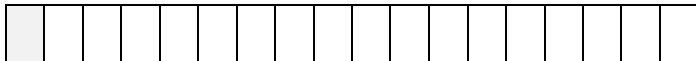
$$\frac{1}{3} \times \frac{1}{6} = \frac{1}{18}$$

This means $\frac{1}{3}$ of $\frac{1}{6}$



This is $\frac{1}{3}$ of a sixth.

We then to think about what fraction it is of the full amount so we need to split the rest of the bar up in the same way.



There are 18 parts now so:

$$\frac{1}{3} \times \frac{1}{6} = \frac{1}{18}$$

To multiply fractions together, you need to multiply the numerators together to get the new numerator and multiply the denominators to get the new denominators.

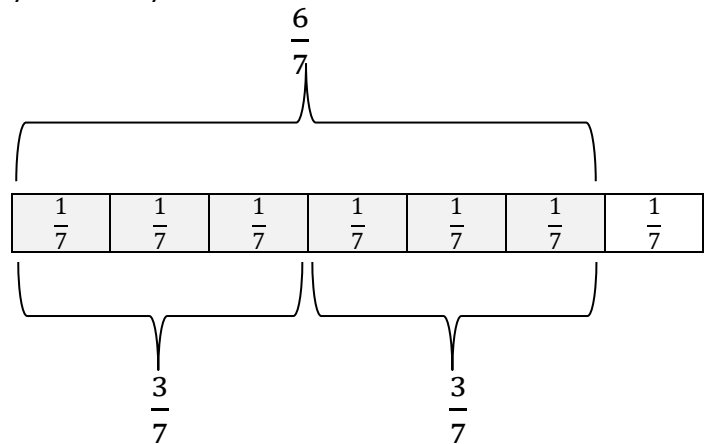
eg.

$$\frac{1}{7} \times \frac{1}{3} = \frac{1}{21}$$

$$\frac{4}{9} \times \frac{3}{7} = \frac{12}{63} = \frac{4}{21}$$

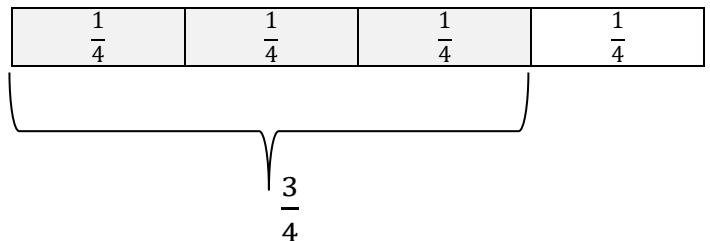
Dividing Fractions

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

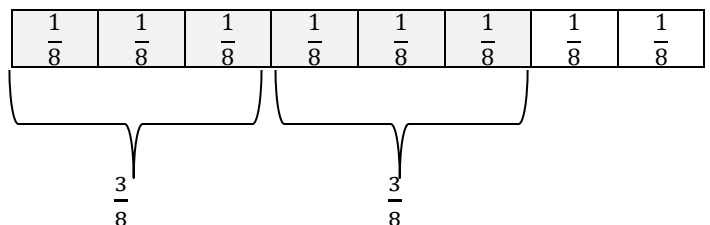
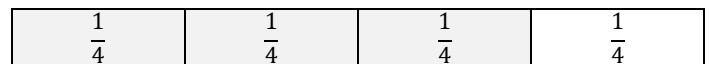


If the numerator will divide by the number you are dividing by then you do not need to change the fraction in any way.

$$\frac{3}{4} \div 2 = \frac{3}{8}$$



We can't divide $\frac{3}{4}$ by 2 because the numerator doesn't divide by 2 so we need to change the fraction into an equivalent fraction where the numerator will divide by 2.



$$\frac{3}{4} = \frac{6}{8}$$

$$\frac{6}{8} \div 2 = \frac{3}{8}$$