Fractions

These pages show you how to cope with fraction calculations without your beloved calculator.

1) Cancelling down — easy

To cancel down or simplify a fraction, divide top and bottom by the same number, till they won't go further:

EXAMPLE: Simplify $\frac{18}{24}$.

Cancel down in a series of easy steps — keep going till the top and bottom don't have any common factors.

$$\frac{18}{24} \overset{\div 3}{=} \frac{6}{8} \overset{\div 2}{=} \frac{3}{4}$$

The number on the top of the fraction is the numerator, and the number on the bottom is the denominator.

2) Mixed numbers — quite easy

Mixed numbers are things like $3\frac{1}{3}$, with an integer part and a fraction part. Improper fractions are ones where the top number is larger than the bottom number. You need to be able to convert between the two.

EXAMPLES:

1. Write $4\frac{2}{3}$ as an improper fraction.

1) Think of the mixed number as an addition:
$$4\frac{2}{3} = 4 + \frac{2}{3}$$
2) Turn the integer part into a fraction:
$$4 + \frac{2}{3} = \frac{12}{3} + \frac{2}{3} = \frac{12+2}{3} = \frac{14}{3}$$

2. Write $\frac{31}{4}$ as a mixed number.

Divide the top number by the bottom.
1) The answer gives the whole number part.
2) The remainder goes on top of the fraction.

31 ÷ 4 = 7 remainder 3 so $\frac{31}{4} = 7\frac{3}{4}$

3) Multiplying — easy

Multiply top and bottom separately. It usually helps to cancel down first if you can.

EXAMPLE: Find $\frac{8}{15} \times \frac{5}{12}$.

Cancel down by dividing top and bottom by any common factors you find in either fraction:

8 and 12 both divide by 4; 15 and 5 both divide by 5:
$$\frac{\overset{2}{\cancel{8}}}{15} \times \frac{5}{\underset{3}{\cancel{12}}} = \frac{2}{\cancel{15}_{3}} \times \frac{\overset{1}{\cancel{5}}}{3}$$

Now multiply the top and bottom numbers separately:
$$= \frac{2}{3} \times \frac{1}{3} = \frac{2 \times 1}{3 \times 3} = \frac{2}{9}$$

4) Dividing — quite easy

Turn the 2nd fraction UPSIDE DOWN and then multiply:

When you're multiplying or dividing with mixed numbers, always turn them into improper fractions first.

EXAMPLE: Find $2\frac{1}{3} \div 3\frac{1}{2}$.

Rewrite the mixed numbers as fractions:
$$2\frac{1}{3} \div 3\frac{1}{2} = \frac{7}{3} \div \frac{7}{2}$$

Turn $\frac{7}{2}$ upside down and multiply:
$$= \frac{7}{3} \times \frac{2}{7}$$

Simplify by cancelling the 7s:
$$= \frac{1}{3} \times \frac{2}{1} = \frac{2}{3}$$