# Scientific Notation

## Calculator


sing the calculator and Scientific Notation


Using the calculator for fractions


Simplifying Ratios


Ratio & Proportional Division

# Starter Questions

## Calculator

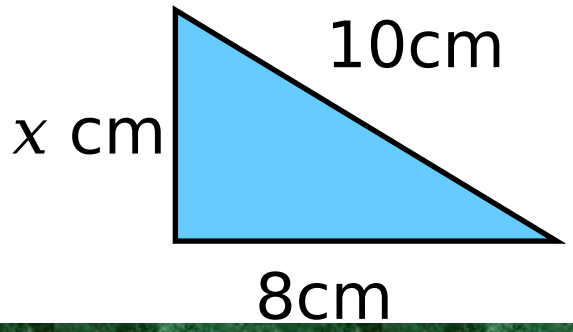
1. Write in scientific notation

(a) 2300 (b) 0.00534 (c) 569200 (d) 0.05060

2. True or false

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

3. Find the length of $x$



# Scientific Notation
## Calculator

Learning Intention

1. To show how to do calculation using scientific notation on the calculator.

Success Criteria

1. To be able to use the calculator to calculate values using scientific notation.

# Using the calculator

We can use scientific notation on the calculator. Depending on your calculator you will use one of the following buttons.

$x^y$ $10^x$ ^ EXP EE

(you may have to use the shift button)

Enter the $5.4 \times 10^3$ into your calculator

Calculator Keys

| 5 | • | 4 | x | 1 | 0 | $x^y$ | 3 |
|---|---|---|---|---|---|---|---|

# Using the calculator

$x^y$ $10^x$ ^ EXP EE

(you may have to use the sh[illegible])

Not the subtraction button

Example: $6.25 \times 10^{-7}$

Calculator Keys

| 6 | • | 2 | 5 | x | 1 | 0 | $x^y$ | - | 7 |
|---|---|---|---|---|---|---|---|---|---|

Example: $8.31 \times 10^{11}$

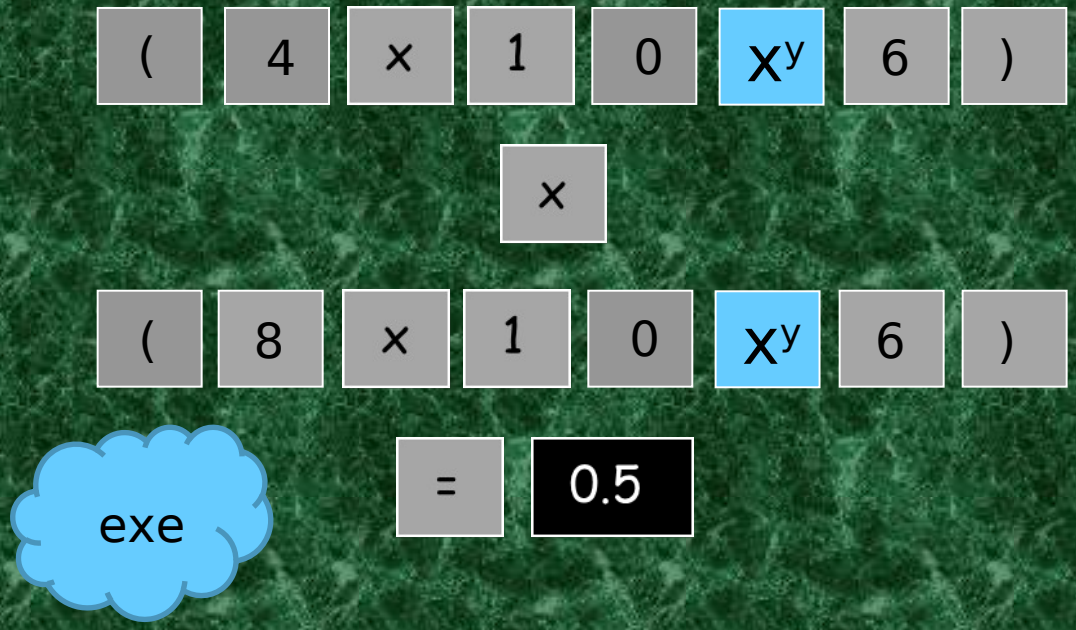
Calculator Keys

| 8 | • | 3 | 1 | x | 1 | 0 | $x^y$ | 1 | 1 |
|---|---|---|---|---|---|---|---|---|---|

# Using the calculator

Calculate: $4 \times 10^6 \div 8 \times 10^6$

It is good practice to put each value in brackets



# Starter Questions

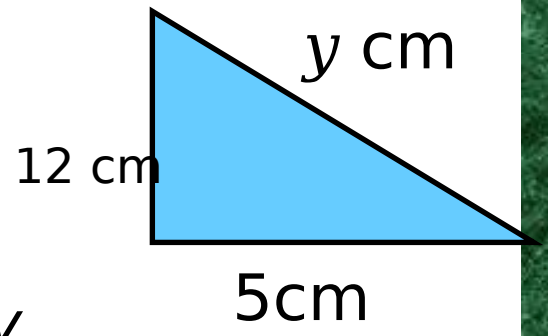
## Calculator

1. Write in scientific notation

(a) $4.5 \times 2.3 \times 10^{3}$ (b) $0.053 \times 3.4 \times 10^{-4}$

2. True or false

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




3. Find the length of $y$

# Using the calculator

## Fractions

Learning Intention

1. To show how to do calculation using fractions on the calculator.

Success Criteria

1. To be able to use the calculator to calculate fractions.



# Using the calculator

## Reminder on fractions

A fraction has a numerator and denominator

The value of a fraction can be calculated by dividing the numerator by the denominator

$$\frac{3}{4} \quad 4\overline{)3.00}\ 0.75$$

A proper fraction has a value of less than 1

An improper fraction is of the form $\frac{a}{b} \qquad a > b$

A mixed number contains whole number and fractions



# Using the calculator

## Fractions

We can use the calculator when working with fractions

The fraction button is : $a\,{}^{b}\!/_{c}$

Example 1: Express $\frac{3}{4}$ as a decimal

| 3 | $a\,{}^{b}\!/_{c}$ | 4 | = | 0.75 |
|---|---|---|---|---|

# Using the calculator

## Fractions

Example 2: Express $\frac{5}{10}$ as a decimal

| 5 | $a\,{}^{b}\!/_{c}$ | 10 | = | 1 ⌐2 | $a\,{}^{b}\!/_{c}$ | = | 0.5 |
|---|---|---|---|---|---|---|---|

Example 3: Express $\frac{7}{4}$ as a mixed number

| 7 | $a\,{}^{b}\!/_{c}$ | 4 | = | 1 ⌐3 ⌐4 |
|---|---|---|---|---|

# Using the calculator

## Fractions

Example 4: Express $4\frac{2}{3}$ as a improper fraction

| 4 | $a\,{}^{b}\!/\!_{c}$ | 2 | $a\,{}^{b}\!/\!_{c}$ | 3 | = | 2nd | $a\,{}^{b}\!/\!_{c}$ | 14 ┌3 |
|---|---|---|---|---|---|---|---|---|

Example 5: Add $4\frac{3}{5}+\frac{2}{3}$

| 4 | $a\,{}^{b}\!/\!_{c}$ | 3 | $a\,{}^{b}\!/\!_{c}$ | 5 | + | 2 | $a\,{}^{b}\!/\!_{c}$ | 3 | = | 5 ┌4 ┌ 15 |
|---|---|---|---|---|---|---|---|---|---|---|

# Ratios

What is a ratio ?

Learning Intention

1. To understand what a ratio is and explain how we can sometimes simplify them.

Success Criteria

1. Understand the term ratio.
.
2. Calculate and simplify basic ratios.

# Ratios

What is a ratio ?

Ratios can be used to compare different quantities

Example : There are 2 triangles and 3 rectangles.



The ratio of triangles to rectangles is said to be 2 : 3

Note: The ratio of rectangles to triangles is said to be 3 : 2

# Ratios

## Simplifying a ratio ?

Simplifying a ratio is like simplifying fractions

Fraction : $\frac{6}{8} = \frac{6^{\div 2}}{8^{\div 2}} = \frac{3}{4}$

Ratio : $6:8 = 6^{\div 2} : 8^{\div 2} = 3:4$

# Ratios

Simplifying a ratio ?

Sometimes we need to multiply to simplify

Ratio : $\frac{1}{3} : 5 = \frac{1}{3} \times 3 : 5 \times 3 = 1 : 15$

# Ratios

Simplifying a ratio ?

When working with ratios,
the two units MUST be the same

Ratio : $\frac{1}{4}$ hour : 40 minutes

= 15 minutes : 40 minutes

= 3 minutes : 8 minutes

# Ratios

## Simplifying a ratio ?

By first multiplying by ten to get rid of the decimals simplifying the following ratios:

| | | | |
|---|---|---|---|
| (a) | 2.2 : 3.3 | 22 : 33 | 2 : 3 |
| (b) | 1.6 : 9.6 | 16 : 96 | 1 : 6 |
| (c) | 0.5 : 100 | 5 : 1000 | 1 : 200 |
| (d) | 8.5 : 9.5 | 85 : 95 | 17 : 19 |

# Ratios

Simplifying a ratio ?

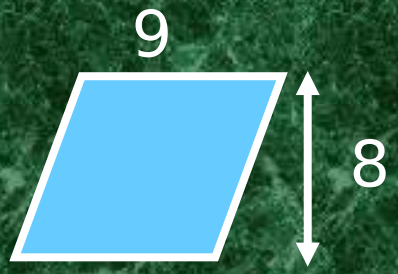
By eliminating the fractions simplify the ratios.

| | | | |
|---|---|---|---|
| $(a)$ | $\frac{1}{2}:\frac{3}{4}$ | Multiply each side by 4 | 2 : 3 |
| $(b)$ | $\frac{1}{7}:\frac{3}{5}$ | Multiply each side by 35 | 5 : 21 |
| $(c)$ | $\frac{2}{3}:1\frac{3}{4}$ | Multiply each side by 12 | 8 : 21 |

# Starter Questions

**1.** $6x + 5 = 59$

2. Calculate the area of the shape.




**3.** **Round to 2 decimal places.**

**(a) 0.853** **(b) 0.356** **(c) 1.995**

4. True or false $\frac{5}{2} + \frac{1}{4} = 2\frac{3}{4}$

# Ratios

## Ratio & Proportional Division

Learning Intention

1. Explain how to work out Ratio & Proportional division by using shares.

Success Criteria

1. Work out the number of shares for a ratio.
2. Solve problems using shares.
3. Show appropriate working.

# Ratios

Ratio & Proportional Division

Example : Bill and Ben share a raffle win of £400 in the ratio 3:5. How much does each get ?

Step 1 : Since the ratio is 3:5, there are :

3+5 = 8 shares

Step 2 : Each share is worth : $8\overline{)400}$ = 50

Step 3 : Bill gets 3 x 50 = £150

Ben gets 5 x 50 = £25

Check ! 150 + 250 = 400

# Ratios

Ratio & Proportional Division

Example : Ryan and Ross share 24 cakes in the ratio 3:1. How many cakes does each get ?

Step 1 : Since the ratio is 3:1, there are :

3+1 = 4 shares

Step 2 : Each share is worth : $4\overline{)24}$ = 6

Step 3 : Ryan gets 3 x 6 = 18

Ross gets 1 x 6 = 6

Check !
18 + 6
= 24