

## Use BODMAS to Calculate Simple Sums – iNA8

**BODMAS** means **B**rackets, **O**ther, **D**ivision, **M**ultiplication, **A**ddition, **S**ubtraction.

This tells you that in simple calculations to do **Brackets first then Division then Multiplication then Addition then Subtraction**. **Other** means things like Squaring, Cubing or Square-Rooting. Sometime BIDMAS is used instead of BODMAS where the **I** stands for **Index**. Index means powers like square and cube.

### Example

Work out

a)  $3 + 4 \times 5$       b)  $6 \div 3 + 4 \times 5$       c)  $6 \div 3 \times 4$       d)  $(3 - 2) \times 4$

*x before +*      *÷ then x then +*      *÷ before x*      *brackets first*

**Solution**      a)  $3 + 20 = 23$       b)  $2 + 20 = 22$       c)  $2 \times 4 = 8$       d)  $1 \times 4 = 4$

**Also** watch out for division sums written as fractions like e)  $\frac{3+12}{5}$  they really mean  $\frac{(3+12)}{5} = \frac{15}{5} = 15 \div 5 = 3$

**Brackets** can be used to give a sum a different result. This is because brackets are always done first and so change the order that sums are done.

### Example

Add brackets to make,  $6 \div 3 \times 4 = \frac{1}{2}$

### Solution

Add brackets around the,  $3 \times 4$ , so that the multiplication is done first.

So,  $6 \div (3 \times 4) = 6 \div (12) = 6 \div 12 = \frac{1}{2}$ , as required.

### Your Turn!!

Calculate      a)  $3 + 4 \times 5 - 1$       b)  $6 - (2 + 4)$   
 Add brackets so that      c)  $1 + 2 \times 5 = 15$       d)  $2 + 3 \times 6 = 30 \div 6 - 5$

## RAPID 'ACID' TEST – Blank out the page above before answering these!

- Calculate  $9 + 5 \times 2 - 1$
- Add brackets so: a)  $1 + 2 \times 4 - 3 = 9$       b)  $1 + 2 \times 4 - 3 = 3$

## Use Index Form & Understand the Words Square, Positive Square Root & Cube – iNA9

A quick way of writing,  $3 \times 3 \times 3 \times 3$  is  $3^4$ . This is called **index** notation or index form.

*The index*

*There are 4 threes multiplied together, so we write the index as 4.*

*The index is also called the power*

**Similarly**  $5 \times 5 \times 5 \times 5 \times 7 \times 7$  can be written  $5^4 7^2$ .

### Your Turn!!

- Write  $4 \times 4 \times 4 \times 5 \times 5$  in **index** form.
- What is another way of writing  $5^6$ ?
- Calculate the value of  $3^{13}$ .
- Calculate the value of  $\sqrt{36481}$ .

**Calculator Check:** *calculators differ, how does yours work?*

To enter index notation use the  $x^y$  button.

e.g. to enter  $5^3$  press  $5 \ x^y \ 3 =$

e.g. to enter  $\sqrt{81}$  press  $81 \ \sqrt{\quad}$  OR  $\sqrt{\quad} \ 81 =$

**Reminders:** **Cube** means multiplied by itself twice, so 4 cubed is,  $4 \times 4 \times 4$  and in index notation is  $4^3$ .

**Square** means multiplied by itself, so 4 **squared** means  $4 \times 4$  which is 16 and in **index** notation is  $4^2$ . The **Square Root** symbol is  $\sqrt{\quad}$  and does the opposite to squaring so  $\sqrt{16} = 4$ .

**Further Example** Find  $\sqrt{81}$ .

**Solution** This means find a number which times itself is 81.  $9 \times 9 = 81$ .

So  $\sqrt{81} = 9$ . We can say that 9 is the **positive square root** of 81.

### Your Turn!!

Calculate e) 4 cubed      f)  $3^2$       g)  $\sqrt{36}$       h) Write  $2 \times 2 \times 2 \times 5 \times 5 \times 5$  in **index** form.

## RAPID 'ACID' TEST – Blank out the page above before answering these!

- Calculate a) 3 squared      b)  $\sqrt{25}$       c)  $2^3$       d)  $\sqrt{974169}$       e)  $2^{16}$       2. Write  $2 \times 2 \times 2 \times 3 \times 3$  in **index** form.