



## Scientific notation- standard form

Objectives :

- Express large and small numbers in scientific notation.
- Use your GDC (Graphic Display Calculator) to find numbers in scientific notation.

### Exercise 1.

Rewrite these numbers in scientific notation

$A = 3627.1$	$A = \dots\dots\dots$	$J = -54 \times 10^{18}$	$J = \dots\dots\dots$
$B = 0.0356$	$B = \dots\dots\dots$	$A = 5900000$	$A = \dots\dots\dots$
$C = -198 \times 10^{-4}$	$C = \dots\dots\dots$	$B = 0.000000008$	$B = \dots\dots\dots$
$D = -2636 \times 10^4$	$D = \dots\dots\dots$	$C = 30200000$	$C = \dots\dots\dots$
$E = 58$	$E = \dots\dots\dots$	$D = 0.00001002$	$D = \dots\dots\dots$
$F = 10.89 \times 10^{-27}$	$F = \dots\dots\dots$	$E = 350 \times 10^6$	$E = \dots\dots\dots$
$G = -34567890 \times 10^2$	$G = \dots\dots\dots$	$F = 0.00053 \times 10^{-5}$	$F = \dots\dots\dots$
$H = 0.12 \times 10^4$	$H = \dots\dots\dots$	$G = 4100 \times 10^{12}$	$G = \dots\dots\dots$
$I = 144 \times 10^{-28}$	$I = \dots\dots\dots$	$H = 0.011500 \times 10^{23}$	$H = \dots\dots\dots$

### Exercise 2.

Rank the following numbers in ascending order.

$450$  ;  $3.22$  ;  $8.9 \times 10^2$  ;  $872 \times 10^{-2}$  ;  $0.00035$  ;  $5.971 \times 10^{-3}$  ;  $11.3 \times 10$  ;  $554.32 \times 10^{-5}$

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### Exercise 3.

Consider the numbers  $x = 3 \times 10^7$  and  $y = 4 \times 10^7$   
Give  $x + y$  and  $xy$  in scientific form.

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### Exercise 4.

Consider the numbers  $x = 3 \times 10^7$  and  $y = 4 \times 10^9$   
Give  $x + y$  and  $xy$  in scientific form.

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### Exercise 5.

$a = 0.0005$ ;  $b = 5 \times 10^{-5}$ ;  $c = 5000$ ;  $d = 0.0005 \times 10^{-2}$

- One of the numbers above is written in the form  $a \times 10^k$  where  $1 \leq a < 10$  and  $k \in \mathbb{Z}$ . Write down this number.  
.....
- Write down the smallest number in the list above.  
.....
- Find  $\frac{abc}{d}$ . Give your answer to 3 significant figures in the form  $a \times 10^k$  where  $1 \leq a < 10$  and  $k \in \mathbb{Z}$ .  
.....

### Exercise 6.

Let  $x = 4.8 \times 10^9$  and  $y = 9.6 \times 10^7$

Find the following giving your answers in the form  $a \times 10^k$  where  $1 \leq a < 10$  and  $k \in \mathbb{Z}$ .

a.  $xy$

.....

b.  $\frac{x}{y}$

.....

c.  $2x + 5y$

.....



### Exercise 7.

Consider the following four numbers.

$$P = 0.00314 ; q = 0.00314 \times 10^2; r = \frac{\pi}{1000}; s = 3.14 \times 10^{-2}$$

- a. One of these numbers is written in the form  $a \times 10^k$  where  $1 \leq a < 10$  and  $k \in \mathbb{Z}$ . Write down this number.

.....

- b. Write down the smallest of these numbers.

.....

- c. Write down the value of  $q + s$ .

.....

- d. Give you answer to part (c.) in the form  $1 \leq a < 10$  and  $k \in \mathbb{Z}$ .

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### Exercise 8.

The distance between two points with coordinates  $(x_1, y_1)$  and  $(x_2, y_2)$  is equal to  $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

- a. Calculate the distance between points A(40,-100) and B(1,-2). Give your answer correct to three significant figures.

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- b. Give your answer from part (a) correct to one decimal places.

.....

- c. Write the answer to part(b) in the form  $a \times 10^k$  where  $1 \leq a < 10$  and  $k \in \mathbb{Z}$ .

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### Exercise 9.

The volume of a hemisphere,  $V$ , is given by the formula

$$V = \sqrt{\frac{4S^3}{243\pi}}$$

Where  $S$  is the total surface area.

The total surface area of a given hemisphere is  $529 \text{ cm}^2$ .



a. Calculate the volume of this hemisphere in  $cm^3$ . Give your answer correct to one decimal place.

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b. Write down your answer to part(a) correct to the nearest integer.

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c. Write down your answer to part(b) in the form  $a \times 10^k$  where  $1 \leq a < 10$  and  $k \in \mathbb{Z}$ .

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### Exercise 10.

Consider the numbers  $p = 3.32 \times 10^{-5}$  and  $q = 5.67 \times 10^{10}$

a. Calculate  $T = \sqrt[4]{pq}$ , correct to two decimal places.

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b. Give your answer to part (a) in the form  $a \times 10^k$  where  $1 \leq a < 10$  and  $k \in \mathbb{Z}$ .

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### Exercise 11.

A cuboid has the following dimensions : length = 9.6 cm, width = 7.4cm, and height = 5.2cm.

a. Write the exact value of the volume of the cuboid, in  $cm^3$ .

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b. Write your answer to part(a) correct to :

i. Two decimal places;

.....

ii. Three significant figures.

.....

c. Write your answer to part (b)(ii) in the form  $a \times 10^k$  where  $1 \leq a < 10$  and  $k \in \mathbb{Z}$ .

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