Standard form

1. Write $0.000\,315$ in standard form.

3.15×10^{-4}

2. (a) Write 0.0234 in standard form.

2.34×10^{-2}

(b) Write 2.40×10^{5} as an ordinary number.

240 000

(c) Calculate, giving your answer in standard form

$$\frac{2.5\times10^{101}}{5\times10^{-98}}$$

Show your working clearly.

$\frac{2.5}{5} \times \frac{10^{101}}{10^{-98}}$

0.5×10^{199}

5×10^{198}

3. $N = \dfrac{1025 \times 623}{254 \times 58^3}$

Evaluate N, giving your answer

(a) To 3 significant figures,

0.0128

(b) To 6 decimal places.

0.012885

4. (a) Write 1.2×10^{-4} as an ordinary number.

0.00012

(b) Calculate $\dfrac{6 \times 10^{144} + 5 \times 10^{142}}{5 \times 10^5}$

Give your answer in standard form.

$\dfrac{605 \times 10^{142}}{5 \times 10^5}$

$\dfrac{605}{5} \times \dfrac{10^{142}}{10^5}$

121×10^{137}

1.21×10^{139}

5. The table gives the area, in km^2, and the population of each of three countries in 2017

Country	Area (km^2)	Population
Greenland	2.166×10^6	5.617×10^4
Sri Lanka	6.561×10^4	2.144×10^7
China	9.597×10^6	1.368×10^9

(a) Write 5.617×10^4 as an ordinary number. 56170

(b) Calculate by how many people the population of China in 2017 was greater than the population of Sri Lanka in 2017 $(1.368 \times 10^9) - (2.144 \times 10^7)$

Give your answer in standard form. $= 1.34656 \times 10^9$

(c) Work out the number of people per km^2 for Greenland in 2017

Give your answer, to 3 significant figures, in standard form.

$$\frac{2.166 \times 10^6}{5.617 \times 10^4}$$

$$0.385 \times \frac{10^6}{10^2} = 38.5$$

$$3.85 \times 10$$

6. (a) Write $248\,000\,000$ in standard form.

2.48×10^{8}

(b) Write 2.56×10^{-4} as an ordinary number.

0.000256

(c) Calculate, giving your answer in standard form

$$\frac{2.5 \times 10^{60} - 1.3 \times 10^{59}}{1.5 \times 10^{-48}}$$

$$= \frac{2.37 \times 10^{60}}{1.5 \times 10^{-48}}$$

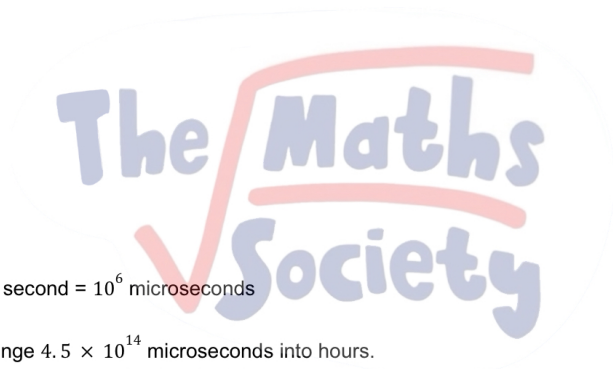
$$= \frac{2.37}{1.5} \times \frac{10^{60}}{10^{-48}}$$

$$= 1.58 \times 10^{108}$$

7. Calculate the value of $\frac{2.89}{12.3-9.91}$

Give your answer as a decimal to 5 significant figures.

$\frac{2.89}{2.39} = 1.2092$



8. 1 second = 10^6 microseconds

Change 4.5×10^{14} microseconds into hours.
Give your answer in standard form.

10^6 ms = 1 s

1 ms = $\frac{1}{10^6}$ s

4.5×10^{14} ms = $\frac{4.50 \times 10^8}{60 \times 60}$

= 125 000 hours

= 1.25×10^5

9. The GDP per capita for a region is defined as follows

$$\text{GDP per capita} = \frac{total\ GDP}{population}$$

Complete the table below, giving each value to 2 significant figures.

Region	Total GDP	Population	GDP per capita
Grenada	1.23×10^9	112 000	10 000
Hungary	1.61×10^{11}	9700 000	16 500
World	8.7×10^{13}	7.67×10^9	11 400

10. Calculate $(4.2 \times 10^{72}) \times (5.5 \times 10^{75})$

Give your answer in standard form.

23.1×10^{147}

$= 2.31 \times 10^{148}$

11.(a) Write $76\,000\,000$ in standard form.

7.6×10^{7}

(b) Write 8.3×10^{-4} as an ordinary number.

0.00083

(c) Calculate $(3 \times 10^{147}) \div (6 \times 10^{122})$

$\frac{3 \times 10^{147}}{6 \times 10^{122}} = 0.5 \times 10^{25}$

$= 5 \times 10^{26}$

Give your answer in standard form.

(d) Write 1.6×10^{41} as a product of its prime factors.

Show your working clearly.

1.6×10^{41}

16×10^{40}

$16 = 2^4$

$10^{40} = (2 \times 5)^{40}$

$2^4 \times 2^{40} \times 5^{40}$

$= 2^{44} \times 5^{40}$