Bishops Online Tutoring

Education Consultancy

Edexcel GCSE Mathematics
STANDARD FORM

Materials Required:

- Pen
- HB Pencil
- Ruler (in centimetres and millimetres)
- Protractor
- Compass

Instructions:

- Use a black ink pen to answer all questions
- Fill your name in the section below
- Answer the questions in the spaces provided
- Show your working out for all answers

Information:

- The marks allocated for each question are displayed within brackets – utilise this information to gauge the appropriate amount of time to dedicate to each question
- Questions marked with an asterisk (*) will assess your written communication; be careful of spelling, punctuation and grammar with these questions

Advice:

- Carefully read the question before attempting to answer it
- Be vary of time and try to answer every question
- If you have enough time in the end, go back and check your answers. A good way to check your answers is to retry the question with the hope of getting the same answer as before without looking at your working out from before

CALCULATOR ALLOWED

NAME:	

1. (a) Write the number 0.00037 in standard form.

3.7×10^{-4} **(1)**

(b) Write 8.25 × 103 as an ordinary number.

3250 **(1)**

(c) Work out $(2.1 \times 10^8) \times (6 \times 10^{-5})$.
Write your answer in standard form.

$2.1 \times 10^8 \times 6 \times 10^{-5}$
$= 12.6 \times 10^3$
$= 1.26 \times 10^4$

1.26×10^4 **(2)**

(4 marks)

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2. (a) Write 6.43×10^5 as an ordinary number.

643000 **(1)**

(b) Work out the value of $2 \times 10^7 \times 8 \times 10^{-12}$.
Give your answer in standard form.

$2 \times 10^7 \times 8 \times 10^{-12}$
$= 16 \times 10^{-5}$
$= 1.6 \times 10^{-4}$

1.6×10^{-4} **(2)**

(3 marks)

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3. (a) Write down the value of 10^0

1

.....

(1)

(b) Write 6.7×10^{-5} as an ordinary number.

0.000067

.....

(1)

(c) Work out the value of $(3 \times 10^7) \times (9 \times 10^6)$.
Give your answer in standard form.

$3 \times 10^7 \times 9 \times 10^6$

$= 27 \times 10^{13}$

$= 2.7 \times 10^{14}$

2.7×10^{14}

.....

(2)

(4 marks)

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4. (a) Write 8.2×10^5 as an ordinary number.

820000

.....

(1)

(b) Write 0.000 376 in standard form.

3.76×10^{-4}

.....

(1)

(c) Work out the value of $(2.3 \times 10^{12}) \div (4.6 \times 10^3)$.
Give your answer in standard form.

$\frac{2.3 \times 10^{12}}{4.6 \times 10^3} = 0.5 \times 10^9$

$\downarrow$

5×10^8

5×10^8

.....

(2)

(4 marks)

5. A floppy disk can store 1 440 000 bytes of data.

(a) Write the number 1 440 000 in standard form.

1.44×10^6

(1)

A hard disk can store 2.4×10^9 bytes of data.

(b) Calculate the number of floppy disks needed to store the 2.4×10^9 bytes of data.

$2.4 \times 10^9 \div 1.44 \times 10^6 = 1666.6$

1667 floppy discs needed.

(3)

(4 marks)

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6. (a)

(i) Write 40 000 000 in standard form.

4×10^7

(ii) Write 3×10^{-5} as an ordinary number.

0.00003

(2)

(b) Work out the value of

$$3 \times 10^{-5} \times 40\,000\,000$$

Give your answer in standard form.

$3 \times 10^{-5} \times 4 \times 10^7$

$= 12 \times 10^2$

$= 1.2 \times 10^3$

1.2×10^3

(2)

(4 marks)

7. (a) Write the number 40 000 000 in standard form.

4×10^7

(1)

(b) Write 1.4×10^{-5} as an ordinary number.

0.000014

(1)

(c) Work out

$$(5 \times 10^4) \times (6 \times 10^9)$$

Give your answer in standard form.

$= 5 \times 10^4 \times 6 \times 10^9$

$= 30 \times 10^{13} \rightarrow 3 \times 10^{14}$

3×10^{14}

(2)

(4 marks)

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8. (a) Write 6.4×10^4 as an ordinary number.

64000

(1)

(b) Write 0.0039 in standard form.

3.9×10^{-3}

(1)

(c) Write 0.25×10^7 in standard form.

2.5×10^6

(1)

(d) Work out $(3.2 \times 10^5) \times (4.5 \times 10^4)$ in standard form.

$3.2 \times 10^5 \times 4.5 \times 10^4$

$= 14.4 \times 10^9$

$= 1.44 \times 10^{10}$

1.44×10^{10}

(2)

(5 marks)

9. (a) (i) Write 7900 in standard form.

7.9×10^3

(ii) Write 0. 00035 in standard form.

3.5×10^{-4}

(2)

(b) Work out $\frac{4 \times 10^3}{8 \times 10^{-5}}$

Give your answer in standard form.

$\frac{4 \times 10^3}{8 \times 10^{-5}} = 0.5 \times 10^8$

$= 5 \times 10^7$

5×10^7

(2)

(4 marks)

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10. (a) Write 30 000 000 in standard form.

3×10^7

(1)

(b) Write 2×10^{-3} as an ordinary number.

0.002

(1)

(2 marks)

---

11. (a) Write 5.7×10^{-4} as an ordinary number.

0.00057

(1)

(b) Work out the value of $(7 \times 10^4) \times (3 \times 10^5)$

Give your answer in standard form.

$7 \times 10^4 \times 3 \times 10^5$

$= 21 \times 10^9 \rightarrow 2.1 \times 10^{10}$

2.1×10^{10}

(2)

(3 marks)

12. Write the following numbers in order of size.
Start with the smallest number.

0.038×10^2 $\quad$ 3800×10^{-4} $\quad$ 380 $\quad$ 0.38×10^{-1}

3.8 (3) $\quad$ 0.38 (2) $\quad$ (4) $\quad$ 0.038 (1)

0.38×10^{-1}, 3800×10^{-4}, 0.038×10^{2}, 380

(2 marks)

13. The time taken for light to reach Earth from the edge of the known universe is 14 000 000 000 years.

Light travels at the speed of 9.46×10^{12} km/year.

Work out the distance, in kilometres, from the edge of the known universe to Earth. Give your answer in standard form.

$S = \frac{D}{T}$

$D = ST$

$D = 9.46 \times 10^{12} \times 1.4 \times 10^{10}$

$= 13.244 \times 10^{22}$

$= 1.3244 \times 10^{2}$

1.3244×10^{23} km

(3 marks)

14. The surface area of Earth is 510 072 000 km^2.
The surface area of Jupiter is $6.21795 \times$ ~~1010 km^2~~ 10^{10}

The surface area of Jupiter is greater than the surface area of Earth.
How many times greater?
Give your answer in standard form.

$6.21795 \times 10^{10} \div 5.10072 \times 10^{8}$

$= 1.219033 \times 10^{2}$

1.22×10^{2}

(3 marks)

15. $p^2 = \dfrac{x - y}{xy}$

$x = 8.5 \times 10^9$
$y = 4 \times 10^8$

Find the value of p.
Give your answer in standard form correct to 2 significant figures.

$p^2 = \dfrac{8.5 \times 10^9 - 4 \times 10^8}{8.5 \times 10^9 \times 4 \times 10^8} \rightarrow = \dfrac{8.1 \times 10^9}{3.4 \times 10^{18}}$

$p^2 = 2.38235 \times 10^{-9}$

$p = \sqrt{2.38235 \times 10^{-9}}$

$p = 4.898979 \times 10^{-5}$

4.9×10^{-5}

(4 marks)

16. $y^2 = \dfrac{ab}{a + b}$

$a = 3 \times 10^8$
$b = 2 \times 10^7$

Find y.
Give your answer in standard form correct to 2 significant figures.

$y^2 = \dfrac{3 \times 10^8 \times 2 \times 10^7}{3 \times 10^8 + 2 \times 10^7} \rightarrow = \dfrac{6 \times 10^{15}}{3.2 \times 10^8}$

$y^2 = 18750000$

$y = \sqrt{18750000}$

$y = 4330.127...$
$= 4.3 \times 10^3$

$y = 4.3 \times 10^3$

(4 marks)