Name: _____

GCSE (1 – 9)

Standard Form

Instructions

- Use **black** ink or ball-point pen.
- Answer all Questions.
- Answer the Questions in the spaces provided
  – *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The marks for each Question are shown in brackets
  – *use this as a guide as to how much time to spend on each Question.*

Advice

- Read each Question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every Question.
- Check your answers if you have time at the end

1 (a) Write 1.2×10^5 as an ordinary number.

120 000

(1)

(b) Write 0.003 in standard form.

3×10^{-3}

(1)

(Total for Question 1 is 2 marks)

2 (a) Write 42 900 000 in standard form.

4.29×10^7

(1)

(b) Write 3.61×10^{-3} as an ordinary number.

0.00361

(1)

(Total for Question 2 is 2 marks)

3 (a) Write 9.516×10^6 as an ordinary number.

9 516 000

(1)

(b) Write 0.0724 in standard form.

7.24×10^{-2}

(1)

(c) Calculate $(8.694 \times 10^2) \div (6.21 \times 10^{-3})$
Give your answer in standard form.

Type in calculator

140000

1.4×10^5

(2)

(Total for Question 3 is 4 marks)

4 (a) Write 5.12×10^{-5} as an ordinary number.

0.0000512

(1)

(b) Write 5 600 000 in standard form.

5.6×10^{6}

(1)

(Total for Question 4 is 2 marks)

5 (a) Write 0.0065 in standard form.

6.5×10^{-3}

(1)

(b) Write 3×10^{4} as an ordinary number.

$30\ 000$

(1)

(Total for Question 5 is 2 marks)

6 (a) Write 3.08×10^{-5} as an ordinary number.

0.0000308

(1)

(b) Write 5 million in standard form.

$5\ 000\ 000$

5×10^{6}

$5\ 00$

(1)

(c) Calculate $(6.3 \times 10^{5}) \times (2.5 \times 10^{-2})$
Give your answer in standard form.

15750

1.575×10^{4}

(2)

(Total for Question 6 is 4 marks)

7 Work out $(8.69 \times 10^{-5}) \div (5.5 \times 10^{-7})$

Give your answer in standard form.

158

1.58×10^{2}

(Total for Question 7 is 2 marks)

8 (a) Write 0.00931 in standard form.

9.31×10^{-3}

(1)

(b) Write 7.429×10^{3} as an ordinary number.

7429

(1)

(Total for Question 8 is 2 marks)

9 (a) Write 5.2×10^{-1} as an ordinary number.

0.52

(1)

(b) Work out the value of $(3.2 \times 10^{3}) \times (6.5 \times 10^{4})$

Give your answer in standard form.

$208\ 000\ 000$

2.08×10^{8}

(2)

(Total for Question 9 is 3 marks)

10 Write 0.21×10^{6} in standard form.

$0.21 \times 10 \times 10^{5}$

2.1×10^{5}

(Total for Question 10 is 1 mark)

11 Work out $(6.7 \times 10^4) \times (3.4 \times 10^{-8})$
Give your answer as an ordinary number.

$$2.278 \times 10^{-3}$$

$$0.002278$$

(Total for Question 11 is 2 marks)

12 Work out $\dfrac{0.03 \times 0.02}{0.008}$

Give your answer in standard form.

without a calculator :

$$\frac{3 \times 10^{-2} \times 2 \times 10^{-2}}{8 \times 10^{-3}}$$

$$\frac{6 \times 10^{-4}}{8 \times 10^{-3}} = 0.75 \times 10^{-1}$$

$$= 7.5 \times 10^{-2}$$

$$7.5 \times 10^{-2}$$

(Total for Question 12 is 3 marks)

13 Work out $\dfrac{3.744 \times 10^9}{2.4 \times 10^5}$

Give your answer in standard form.

$$15600$$

$$1.56 \times 10^4$$

(Total for Question 13 is 2 marks)

14 Work out the value of $(5 \times 10^3) \times (6 \times 10^7)$
Give your answer in standard form.

without calc : 30×10^{10}

$$3 \times 10^{11}$$

$$3 \times 10^{11}$$

(Total for Question 14 is 2 marks)

15 (a) Write 0.000 054 376 in standard form.

$$5.4376 \times 10^{-5}$$

(1)

(b) Write 4.15×10^6 as an ordinary number.

$$4\ 150\ 000$$

(1)

(c) Work out $\dfrac{4.1 \times 10^5 \times 7.3 \times 10^4}{2 \times 10^{-6}}$

$$1.4965 \times 10^{16}$$

(2)

(Total for Question 15 is 4 marks)

16 Write these numbers in order of size.
Start with the smallest number.

6.1×10^2 0.061×10^2 6100×10^{-4} 61

610 6.1 0.61 61

6100×10^{-4} 0.061×10^2 61 6.1×10^2
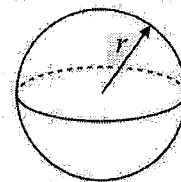
(Total for Question 16 is 2 marks)

17 A sphere has a radius of 6.4×10^6 metres.
Calculate the volume of this sphere.

Give your answer in standard form to 1 decimal place.

$$\frac{4}{3}\pi\left(6.4 \times 10^6\right)^3$$

Volume of sphere $= \dfrac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$

$$1.1 \times 10^{21}\ m^3$$

(Total for Question 17 is 3 marks)

18 A large rock has a weight of 1.2×10^4 grams.

Find, in standard form, the weight of 12 of these large rocks.

$1.2 \times 10^4 \times 12$

$1.2 \times 10^4 \times 1.2 \times 10^1$

1.44×10^5 _____ grams

(Total for Question 18 is 2 marks)

---

19 Write these numbers in order of size.
Start with the smallest number.

3.5×10^2	0.035×10^5	350×10^{-2}	35×10^0
350	3500	3.5	35

350×10^{-2} 35×10^0 3.5×10^2 0.035×10^5

(Total for Question 19 is 2 marks)

---

20 The diameter of Neptune is 5.0×10^4 km
The diameter of Mars is 6.8×10^3 km
Calculate the difference between the diameter of Neptune and the diameter of Mars.
Give your answer in standard form.

$5 \times 10^4 = 50000$

$6.8 \times 10^3 = 6800$

$50000 - 6800 = 43200$

4.32×10^4 _____ km

(Total for Question 20 is 2 marks)

---

21 One electron has a mass of 9.1×10^{-31} grams.

Find the mass of 250 of electrons.

$9.1 \times 10^{-31} \times 250$

2.275×10^{-28} _____ grams

(Total for Question 21 is 2 marks)

22 The area of Australia is 7.7×10^6 km^2
The area of Cyprus is 9.3×10^3 km^2
How many times larger is Australia than Cyprus.
Give your answer to the nearest whole number.

$$\frac{7.7 \times 10^6}{9.3 \times 10^3} = 827.956\ldots$$

828

(Total for Question 22 is 2 marks)

---

23 The area of the Pacific Ocean is 3.61×10^8 km^2
The area of the Atlantic Ocean is 8.51×10^7 km^2
Find the total area of the Pacific Ocean and the Atlantic Ocean.
Give your answer in standard form.

$$3.61 \times 10^8 + 8.51 \times 10^7$$

$$446100000$$

4.461×10^8 km^2

(Total for Question 23 is 2 marks)

---

78 000 000

24 The distance between Earth and Mars is 78 million kilometres.
The speed of light is 3×10^5 km/s

Calculate the time, in seconds, it takes for light to travel from Earth to Mars.
Give your answer in standard form.

$$Time = \frac{78000000}{3 \times 10^5} = \frac{780}{3} = 260$$

$$= 260$$

$$= 2.6 \times 10^2$$

2.6×10^2 s

(Total for Question 24 is 2 marks)