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

(1)

3.7×10^{-4}

(b) Write 8.25×10^3 as an ordinary number.

(1)

8250

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

12.6×10^3

1.26×10^4

1.26×10^4 (2)

(4 marks)

---

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.

16×10^{-5}

1.6×10^{-4}

1.6×10^{-4}

(2)

(3 marks)

---

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.

27×10^{13}

2.7×10^{14}

2.7×10^{14}

(2)

(4 marks)

---

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.

0.5×10^9

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.

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

$= 1666.\dot{6}$

1667

(3)

(4 marks)

---

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.

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

12×10^2

1.2×10^3

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.

30×10^{13}

3×10^{14}

(2)

(4 marks)

---

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.

14.4×10^{9} 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.

0.5×10^{8}

5×10^{7}

(2)
(4 marks)

---

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. 21×10^{9}

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 3800×10^{-4} 380 0.38×10^{-1}

3.8 0.38 380 0.038

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.

distance = speed × time
= $9.46 \times 10^{12} \times 14\,000\,000\,000$

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 × 1010 km^2.

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

$\frac{6.21795 \times 10^{10}}{510072000} = 1.219 \times 10^{2}$ (481)

(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.

$$p = \sqrt{\frac{8.5\times10^9 - 4\times10^8}{(8.5\times10^9)(4\times10^8)}}$$

$$= 4.9 \times 10^{-5} \quad (2sf)$$

$p = 4.9 \times 10^{-5}$

(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.

$$y = \sqrt{\frac{(3\times10^8)(2\times10^7)}{(3\times10^8) + (2\times10^7)}}$$

$$= 4330.127019$$

$$= 4.3 \times 10^3 \quad (2sf)$$

$y = 4.3 \times 10^3$

(4 marks)
