Standard Form

SCAN ME

REVISE THIS TOPIC

For the entire booklet

1 (a) Write 6.2×10^3 as an ordinary number.

6200

(1)

(b) Write the number 14000 in standard form.

1.4×10^4

(1)

(Total for Question 1 is 2 marks)

2 (a) Write 3.3×10^{-5} as an ordinary number.

0.000033

(1)

(b) Write the number 0.0004 in standard form.

4×10^{-4}

(1)

(Total for Question 2 is 2 marks)

3 (a) Write 9.3×10^{-4} as an ordinary number.

0.00093

(1)

(b) Write the number 65200 in standard form.

6.5200

(1)

(Total for Question 3 is 2 marks)

4 (a) Write 9.61×10^6 as an ordinary number.

9,610,000

(1)

(b) Write the number 0.62 in standard form.

6.2×10^{-1}

(1)

(Total for Question 4 is 2 marks)

5 (a) Write 8×10^{-2} as an ordinary number.

0.08

(1)

(b) Write the number 770 000 in standard form.

7.7×10^5

(1)

(Total for Question 5 is 2 marks)

6 (a) Write 7.5×10^2 as an ordinary number.

750

(1)

(b) Write the number 0.0404 in standard form.

4.04×10^{-2}

(1)

(Total for Question 6 is 2 marks)

7 (a) Write the number five million in standard form.

5 000 000

5×10^6

(1)

(b) Write the number six thousand three hundred in standard form.

6300

6.3×10^3

(1)

(Total for Question 7 is 2 marks)

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

6×10^4 6.7×10^2 9×10^3 9.5×10^{-1}

60000 670 9000 0.95

$9.5 \times 10^{-1}, 6.7 \times 10^2, 9 \times 10^3, 6 \times 10^4$

(Total for Question 8 is 2 marks)

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

4×10^{-1} 3×10^{-3} 5×10^2 5.1×10^{-4}

0.4 0.003 500 0.00051

$5.1 \times 10^{-4}, 3 \times 10^{-3}, 4 \times 10^{-1}, 3 \times 10^{-3}$

(Total for Question 9 is 2 marks)

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

5.5×10^4 55×10^2 550×10^3 0.55×10^7

55000 5500 550000 5500000

$55 \times 10^2, 5.5 \times 10^4, 550 \times 10^3, 0.55 \times 10^7$

(Total for Question 10 is 2 marks)

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

0.099×10^{-4} 0.99×10^{-3} 9.9×10^{-5} 990×10^{-9}

0.0000099 0.00099 0.000099 0.00000099

$990 \times 10^{-9}, 0.099 \times 10^{-4}, 9.9 \times 10^{-5}, 0.99 \times 10^{-3}$

(Total for Question 11 is 2 marks)

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

3.1×10^5 3100×10^{-1} 0.31×10^5 31×10^2

310000 310 31000 3100

$3100 \times 10^{-1}, 31 \times 10^2, 0.31 \times 10^5, 3.1 \times 10^5$

(Total for Question 12 is 2 marks)

13 The table shows some information about some planets.

Planet	Distance from Sun (miles)
Mercury	3.5×10^7
Earth	9.3×10^7
Jupiter	4.84×10^8
Saturn	9×10^8
Uranus	1.8×10^9

(a) Write the distance of Saturn from the sun as an ordinary number.

900,000,000 miles

(1)

(b) Mercury is 35 000 000 miles from the sun.
Uranus is twice as far from the sun as Saturn is. ← 1.8×10^8
Complete the table giving your answers in standard form.

(2)

Mars is 1.42×10^8 miles from the sun.

(c) Craig says

"Mars is closer to the sun than Earth is because 1.42 is less than 9.3".

Is Craig correct?
You must give a reason for your answer.

NO $1.42 \times 10^8 = 142,000,000$

$9.3 \times 10^7 = 93,000,000$

93000000 is smaller than 142,000,000

(1)

(Total for Question 13 is 4 marks)

14 (a) Suresh needs to write 32000 in standard form.

His answer is 32×10^3

Explain why Suresh's answer is incorrect.

32 is too big. It should be between 1 and 10 (but not 10 exactly)

(1)

(b) Lisa needs to write 0.068 in standard form.

Her answer is 6.8×10^2

Explain why Lisa's answer is incorrect.

It should be 6.8×10^{-2}

6.8×10^2 is 680 not 0.068

(1)

(Total for Question 14 is 2 marks)

15 (a) Work out $(3 \times 10^4) \times (5 \times 10^6)$

Give your answer in standard form.

15×10^{10}

1.5×10^{11}

(2)

(b) Work out $(7 \times 10^8) \div (2 \times 10^4)$

Give your answer in standard form.

3.5×10^4

(2)

(Total for Question 15 is 4 marks)

16 (a) Work out $(8 \times 10^8) \times (9 \times 10^{-3})$
Give your answer as an ordinary number.

72×10^5
7.2×10^6

7 200 000

(2)

(b) Work out $(9 \times 10^5) \div (3 \times 10^2)$
Give your answer as an ordinary number.

3×10^3

3000

(2)

(Total for Question 16 is 4 marks)

17 (a) Work out $(2 \times 10^{10}) \times (4.3 \times 10^4)$
Give your answer in standard form.

8.6×10^{14}

(2)

(b) Work out $(9 \times 10^5) \div (2 \times 10^{-2})$
Give your answer in standard form.

4.5×10^7

(2)

(Total for Question 17 is 4 marks)

18 (a) Work out $(5 \times 10^3)^2$
Give your answer in standard form.

25×10^6

2.5×10^7

(2)

(b) Work out $(3 \times 10^6) \div (6 \times 10^2)$
Give your answer in standard form.

0.5×10^4

5×10^3

(2)

(Total for Question 18 is 4 marks)

19 (a) Work out $(9 \times 10^{-3})^2$
Give your answer in standard form.

81×10^{-6}

8.1×10^{-5}

(2)

(b) Work out $\dfrac{2 \times 10^9}{8 \times 10^4}$

Give your answer in standard form.

0.5×10^5

5×10^4

(2)

(Total for Question 19 is 4 marks)

20 (a) Work out $(3 \times 10^{10})^3$
Give your answer in standard form.

27×10^{30}

2.7×10^{31}

(2)

(b) Work out $(6 \times 10^4) \div (5 \times 10^{-3})$
Give your answer in standard form.

$\frac{6}{5} = 1\frac{1}{5}$

$= 1.2$

1.2×10^7

(2)

(Total for Question 20 is 4 marks)

21 (a) Work out $(5 \times 10^4) + (2.3 \times 10^2)$
Give your answer in standard form.

$50000 + 230 = 50230$

5.02×10^4

(2)

(b) Work out $(6 \times 10^4) - (4 \times 10^3)$
Give your answer in standard form

$60000 - 4000 = 56000$

5.6×10^4

(2)

(Total for Question 21 is 4 marks)

22 (a) Work out $(6.6 \times 10^2) + (1.5 \times 10^{-2})$
Give your answer as an ordinary number.

$660 + 0.015$
$= 660.015$

660.015

(2)

(b) Work out $(8.02 \times 10^5) - (1 \times 10^2)$
Give your answer as an ordinary number.

$802000 - 100$
$= 801900$

801900

(2)

(Total for Question 22 is 4 marks)

23 (a) Work out 30000×2300
Give your answer in standard form.

69000000

6.9×10^7

(2)

(b) Work out $600000 \div 5000$
Give your answer in standard form

$\frac{600000}{5000} = \frac{600}{5}$
$= 120$

1.2×10^2

(2)

(Total for Question 23 is 4 marks)

24 $a = 6.3 \times 10^4$
$b = 2.1 \times 10^2$

(a) Work out the value of $3a$
Give your answer in standard form.

18.9×10^4

1.89×10^5

(2)

(b) Work out the value of $\frac{a}{b}$

Give your answer in standard form.

$6.3 \div 2.1 = 3$

3×10^2

(2)

(c) Work out the value of $a + b$
Give your answer in standard form.

$63000 + 210$
$= 63210$

6.321×10^4

(2)

(d) Work out the value of b^2
Give your answer in standard form.

$2.1^2 = 4.41$

$$\begin{array}{r} 21 \\ 21 \\ \hline 21 \\ 420 \\ \hline 441 \end{array}$$

4.41×10^4

(3)

(Total for Question 24 is 9 marks)

Solutions

25 $4400 = 4.4 \times 10^n$ $n = 3$

(a) Write $4.4 \times 10^{(n+1)}$ as an ordinary number.

4.4×10^4

44000

(1)

(b) Write 4.4×10^{-n} as an ordinary number.

4.4×10^{-3}

0.0044

(1)

(c) Write 4.4×10^{2n} as an ordinary number.

4.4×10^6

4400000

(1)

(Total for Question 25 is 3 marks)

26 Work out $\dfrac{(6 \times 10^6) \times (8 \times 10^3)}{(2 \times 10^3) - (8 \times 10^2)}$

Give your answer in standard form.

$48 \times 10^9 = 4.8 \times 10^{10}$

$2000 - 800 = 1200 = 1.2 \times 10^3$

$\dfrac{4.8 \times 10^{10}}{1.2 \times 10^3} = 4 \times 10^7$

4×10^7

(Total for Question 26 is 4 marks)