Standard Form

SCAN ME

REVISE THIS TOPIC

For the entire booklet

1 (a) Write 6.2×10^3 as an ordinary number. **[1 mark]**

Answer 6200

1 (b) Write the number 14000 in standard form. **[1 mark]**

Answer 1.4×10^4

2 (a) Write 3.3×10^{-5} as an ordinary number. **[1 mark]**

Answer 0·000033

2 (b) Write the number 0.0004 in standard form. **[1 mark]**

Answer 4×10^{-4}

3 (a) Write 9.3×10^{-4} as an ordinary number. **[1 mark]**

Answer 0·00093

3 (b) Write the number 65200 in standard form. **[1 mark]**

Answer 6.52×10^4

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4 (a) Write 9.61×10^6 as an ordinary number. **[1 mark]**

Answer 9,610,000

4 (b) Write the number 0.62 in standard form. **[1 mark]**

Answer 6.2×10^{-1}

5 (a) Write 8×10^{-2} as an ordinary number. **[1 mark]**

Answer 0.08

5 (b) Write the number 770 000 in standard form. **[1 mark]**

Answer 7.7×10^5

6 (a) Write 7.5×10^2 as an ordinary number. **[1 mark]**

Answer 750

6 (b) Write the number 0.0404 in standard form. **[1 mark]**

Answer 4.04×10^{-2}

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7 (a) Write the number five million in standard form. **[1 mark]**

5 000 000

Answer 5×10^6

7 (b) Write the number six thousand three hundred in standard form. **[1 mark]**

6300

Answer 6.3×10^3

8 Write the following in order of size.
Start with the smallest. **[2 marks]**

6×10^4 6.7×10^2 9×10^3 9.5×10^{-1}

60000 670 9000 0.95

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

9 Write these numbers in order of size.
Start with the smallest number. **[2 marks]**

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

0.4 0.003 500 0.00051

Answer $5.1 \times 10^{-4}, 3 \times 10^{-3}, 4 \times 10^{-1}, 5 \times 10^2$

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

[2 marks]

5.5×10^4 55×10^2 550×10^3 0.55×10^7

55000 5500 550000 5500000

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

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

[2 marks]

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

0.0000099 0.00099 0.000099 0.00000099

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

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

[2 marks]

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

310000 310 31000 3100

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

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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

13 (a) Write the distance of Saturn from the sun as an ordinary number. **[1 mark]**

Answer 900,000,000 miles

13 (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 marks]**

13 (c) Mars is 1.42×10^8 miles from the sun.
Craig says

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

Is Craig correct?
Tick one box and give a reason for your answer. **[1 mark]**

☐ Yes ☑ No ☐ Not possible to tell

Reason $1.42 \times 10^8 = 142,000,000$
$9.3 \times 10^7 = 93,000,000$
93000000 is smaller than 142,000,000

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14 Suresh needs to write 32000 in standard form.

His answer is 32×10^3

14 (a) Explain why Suresh's answer is incorrect. **[1 mark]**

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

Lisa needs to write 0.068 in standard form.

Her answer is 6.8×10^2

14 (b) Explain why Lisa's answer is incorrect. **[1 mark]**

It should be 6.8×10^{-2}

6.8×10^2 is 680 not 0.068

15 (a) Work out $(3 \times 10^4) \times (5 \times 10^6)$
Give your answer in standard form. **[2 marks]**

15×10^{10}

Answer 1.5×10^{11}

15 (b) Work out $(7 \times 10^8) \div (2 \times 10^4)$
Give your answer in standard form. **[2 marks]**

Answer 3.5×10^4

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16 (a) Work out $(8 \times 10^8) \times (9 \times 10^{-3})$
Give your answer as an ordinary number. **[2 marks]**

72×10^5

7.2×10^6

Answer 7 200 000

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

3×10^3

Answer 3000

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

Answer 8.6×10^{14}

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

Answer 4.5×10^7

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

25×10^6

Answer 2.5×10^7

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

0.5×10^4

Answer 5×10^3

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

81×10^{-6}

Answer 8.1×10^{-5}

19 (b) Work out $\frac{2 \times 10^9}{8 \times 10^4}$ **[2 marks]**

Give your answer in standard form.

$\frac{2}{8} = \frac{1}{4} = 0.25$ 0.25×10^5

Answer 2.5×10^4

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20 (a) Work out $(3 \times 10^{10})^3$
Give your answer in standard form. **[2 marks]**

27×10^{30}

Answer 2.7×10^{31}

20 (b) Work out $(6 \times 10^4) \div (5 \times 10^{-3})$
Give your answer in standard form. **[2 marks]**

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

$= 1.2$

Answer 1.2×10^7

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

$50000 + 230 = 50230$

Answer 5.023×10^4

21 (b) Work out $(6 \times 10^4) - (4 \times 10^3)$
Give your answer in standard form. **[2 marks]**

$60000 - 4000 = 56000$

Answer 5.6×10^4

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

$660 + 0.015$

$= 660.015$

Answer 660.015

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

$802000 - 100$

$= 801900$

Answer 801900

23 (a) Work out 30000×2300
Give your answer in standard form. **[2 marks]**

69000000

Answer 6.9×10^7

23 (b) Work out $600000 \div 5000$
Give your answer in standard form. **[2 marks]**

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

$= 120$

Answer 1.2×10^2

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

24 (a) Work out the value of $3a$
Give your answer in standard form. **[2 marks]**

18.9×10^4

Answer 1.89×10^5

24 (b) Work out the value of $\frac{a}{b}$ **[2 marks]**

Give your answer in standard form.

$6.3 \div 2.1 = 3$

Answer 3×10^2

24 (c) Work out the value of $a + b$
Give your answer in standard form. **[2 marks]**

$63000 + 210$
$= 63210$

Answer 6.321×10^4

24 (d) Work out the value of b^2
Give your answer in standard form. **[3 marks]**

$2.1^2 = 4.41$

$21 \times 21 = 441$

Answer 4.41×10^4

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

25 (a) Write $4.4 \times 10^{(n+1)}$ as an ordinary number. **[2 marks]**

4.4×10^4

Answer 44 000

25 (b) Write 4.4×10^{-n} as an ordinary number. **[2 marks]**

4.4×10^{-3}

Answer 0·00 44

25 (c) Write 4.4×10^{2n} as an ordinary number. **[2 marks]**

4.4×10^6

Answer 4 400 000

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. **[4 marks]**

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

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

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

Answer 4×10^7

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