



# Standard Form



← REVISE THIS TOPIC

1 (a) Write  $6.2 \times 10^3$  as an ordinary number. [1 mark]

Answer 6200

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

Answer  $1.4 \times 10^4$

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

Answer 0.000033

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

Answer  $4 \times 10^{-4}$

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

Answer 0.00093

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

Answer  $6.52 \times 10^4$



For the entire booklet





4 (a) Write  $9.61 \times 10^6$  as an ordinary number. [1 mark]

Answer 9,610,000

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

Answer  $6.2 \times 10^{-1}$

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

Answer 0.08

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

Answer  $7.7 \times 10^5$

6 (a) Write  $7.5 \times 10^2$  as an ordinary number. [1 mark]

Answer 750

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

Answer  $4.04 \times 10^{-2}$





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

5 000 000

Answer 5 × 10<sup>6</sup>

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

6300

Answer 6.3 × 10<sup>3</sup>

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

$6 \times 10^4$        $6.7 \times 10^2$        $9 \times 10^3$        $9.5 \times 10^{-1}$   
60000      670      9000      0.95

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Answer 9.5 × 10<sup>-1</sup>, 6.7 × 10<sup>2</sup>, 9 × 10<sup>3</sup>, 6 × 10<sup>4</sup>

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

$4 \times 10^{-1}$        $3 \times 10^{-3}$        $5 \times 10^2$        $5.1 \times 10^{-4}$   
0.4      0.003      500      0.00051

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Answer 5.1 × 10<sup>-4</sup>, 3 × 10<sup>-3</sup>, 4 × 10<sup>-1</sup>, 5 × 10<sup>2</sup>





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

$5.5 \times 10^4$        $55 \times 10^2$        $550 \times 10^3$        $0.55 \times 10^7$   
 $55000$        $5500$        $550000$        $5500000$

---



---



---

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]

$0.099 \times 10^{-4}$        $0.99 \times 10^{-3}$        $9.9 \times 10^{-5}$        $990 \times 10^{-9}$   
 $0.0000099$        $0.00099$        $0.000099$        $0.0000099$

---



---



---

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]

$3.1 \times 10^5$        $3100 \times 10^{-1}$        $0.31 \times 10^5$        $31 \times 10^2$   
 $310000$        $310$        $31000$        $3100$

---



---



---

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



13 The table shows some information about some planets.

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

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.  $\leftarrow 1.8 \times 10^8$   
Complete the table giving your answers in standard form. [2 marks]

13 (c) Mars is  $1.42 \times 10^8$  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

$$1.42 \times 10^8 = 142,000,000$$

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

$93,000,000$  is smaller than  $142,000,000$





14 Suresh needs to write 32000 in standard form.

His answer is  $32 \times 10^3$

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  $6.8 \times 10^2$

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

It should be  $6.8 \times 10^{-2}$   
 $6.8 \times 10^2$  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]

$15 \times 10^{10}$

Answer  $1.5 \times 10^{11}$

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

Answer  $3.5 \times 10^4$





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

$$72 \times 10^5$$
$$7.2 \times 10^6$$

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]

$$3 \times 10^3$$

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  $8.6 \times 10^{14}$

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

Answer  $4.5 \times 10^7$





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

$$25 \times 10^6$$

Answer  $2.5 \times 10^7$

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

$$0.5 \times 10^4$$

Answer  $5 \times 10^3$

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

$$81 \times 10^{-6}$$

Answer  $8.1 \times 10^{-5}$

19 (b) Work out  $\frac{2 \times 10^9}{8 \times 10^4}$   
Give your answer in standard form. [2 marks]

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

Answer  $2.5 \times 10^4$







20 (a)

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

[2 marks]

$$27 \times 10^{30}$$

Answer \_\_\_\_\_

$$2.7 \times 10^{31}$$

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 \_\_\_\_\_

$$1.2 \times 10^7$$

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 \_\_\_\_\_

$$5.02 \times 10^4$$

21 (b)

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

[2 marks]

$$60000 - 4000 = 56000$$

Answer \_\_\_\_\_

$$5.6 \times 10^4$$





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  $30000 \times 2300$   
Give your answer in standard form. [2 marks]

$$69000000$$

Answer  $6.9 \times 10^7$

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

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

$$= 120$$

Answer  $1.2 \times 10^2$





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]

$18.9 \times 10^4$

Answer  $1.89 \times 10^5$

24 (b) Work out the value of  $\frac{a}{b}$   
Give your answer in standard form. [2 marks]

$6.3 \div 2.1 = 3$

Answer  $3 \times 10^2$

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

$63000 + 210$   
 $= 63210$

Answer  $6.321 \times 10^4$

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

$21$   $2.1^2 = 4.41$   
 $21$   

---

 $420$   

---

 $441$

Answer  $4.41 \times 10^4$





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

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

$4.4 \times 10^4$

Answer  $44000$

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

$4.4 \times 10^{-3}$

Answer  $0.0044$

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

$4.4 \times 10^6$

Answer  $4400000$

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

Give your answer in standard form. [4 marks]

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

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

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

Answer  $4 \times 10^7$

