

N47 Standard Form Big and Small Numbers

OCR

14 The table below shows an estimate of the population of some countries.

Country	Population
Ecuador	1.60×10^7
Germany	8.12×10^7
Italy	6.07×10^7
Japan	1.27×10^8
Slovenia	2.06×10^6

(a) Which country has the largest population?

(b) Write the population of Italy as an ordinary number.

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(a) Which country has the largest population?

Japan

(b) Write the population of Italy as an ordinary number.

60,700,000

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(c) The population of Montserrat is 5000.

Write 5000 in standard form.

(d) Complete the following sentence.

The population of is about 5 times the population of

[2]

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Slovenia	2.06×10^6

(c) The population of Montserrat is 5000.

Write 5000 in standard form.

$$5. \times 10^3$$

(d) Complete the following sentence.

The population of ... Germany ... is about 5 times the population of ... Ecuador ...

bigger

[2]

(c) Work out.

$$\frac{5}{8} \text{ of } 90$$

(c) [2]

(d) Write 0.000083 in standard form.

(d) [1]

(c) Work out.

$$\frac{5}{8} \text{ of } 90$$

(c) 56.25 [2]

(d) Write $0.\overbrace{0000}^{\text{m}}083$ in standard form.

(d) 8.3×10^{-5} [1]

14 (a) Write 543 000 in standard form.

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(a) [1]

(b) Write 6.3×10^{-2} as an ordinary number.

(b) [1]

(c) Pierre is given this question.

Work out.
 61000×4000
Give your answer in standard form.

Pierre's answer is 24.4×10^7 .

Is Pierre correct?
Explain your answer.

.....
..... [1]

14 (a) Write 543 000 in standard form.



Video created by W Neill

(a) 5.43×10^5 [1]

(b) Write 6.3×10^{-2} as an ordinary number.

(b) 0.063 [1]

(c) Pierre is given this question.

Work out.
 $\underline{61000} \times \underline{4000}$
Give your answer in standard form.

244000000
 24.4×10^7 x

Pierre's answer is 24.4 $\times 10^7$.

Is Pierre correct?
Explain your answer.

..... Start number needs to be between 1 and 10
..... 2.44×10^8 [1]

22 (a) Beth is given the following question.

Work out

$$4.1 \times 10^5 \times 3 \times 10^2.$$

Give your answer in standard form.

This is Beth's answer to the question.

$$12.3 \times 10^7$$

Explain why Beth's answer is incorrect.

.....

..... [1]

22 (a) Beth is given the following question.

Work out

$$4.1 \times 10^5 \times 3 \times 10^2.$$

Give your answer in standard form.

This is Beth's answer to the question.

$$12.3 \times 10^7$$

Explain why Beth's answer is incorrect.

needs to be between 1 and 10

[1]

10 (a) Write $7 \times 7 \times 7 \times 7$ as a power of 7.

(a) [1]

(b) Complete this working to write 4^3 as a power of 2.

$$4^3 = 4 \times 4 \dots\dots\dots$$

so $4^3 = 2 \times 2 \times 2 \times \dots\dots\dots$

so $4^3 = \dots\dots\dots$ [2]

(c) Write these numbers in order, starting with the largest.

8.1×10^1 1.02×10^3 9.83×10^{-2} 3×10^2

(c) , , , [1]
largest

10 (a) Write $7 \times 7 \times 7 \times 7$ as a power of 7.

(a) 7^4 [1]

(b) Complete this working to write 4^3 as a power of 2.

$$4^3 = 4 \times 4 \times 4 = 64$$

so $4^3 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

so $4^3 = 2^6$ [2]

(c) Write these numbers in order, starting with the largest. ✓

8.1×10^1

1.02×10^3

9.83×10^{-2}

3×10^2

81

1020

0.0983

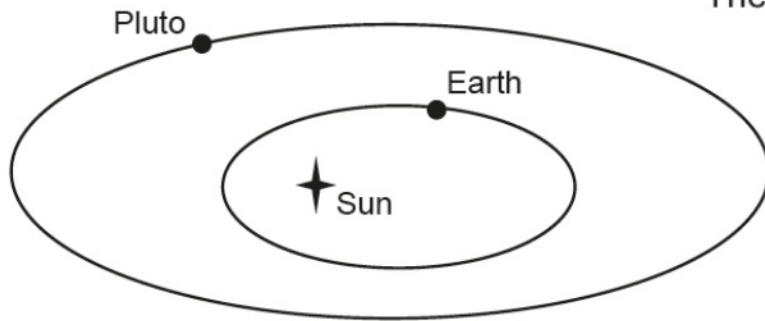
300

(c) 1.02×10^3 , 3×10^2 , 8.1×10^1 , 9.83×10^{-2} [1]
largest

22 Earth and Pluto go around the Sun.
Their distance to the Sun varies.

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The table shows the closest distance that Earth and Pluto get to the Sun.



	Closest distance to the Sun (km)
Earth	1.47×10^8
Pluto	4.44×10^9

(b) Give a reason why we **cannot** use this information to say

The distance of Pluto to the Sun is always
30 times the distance of Earth to the Sun.

.....

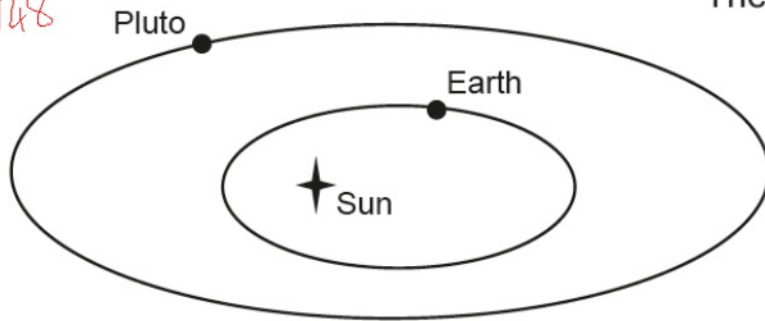
..... [1]

22 Earth and Pluto go around the Sun.

Created by W Neill

N47 Their distance to the Sun varies.

N48



The table shows the closest distance that Earth and Pluto get to the Sun.

	Closest distance to the Sun (km)
Earth	1.47×10^8
Pluto	4.44×10^9

$\times 3 \left(\begin{array}{l} 1.47 \times 10^8 \\ 4.44 \times 10^9 \end{array} \right) \times 10$

= $\times 30$

(a) Show that the closest distance of Pluto to the Sun is roughly 30 times the closest distance of Earth to the Sun. [2]

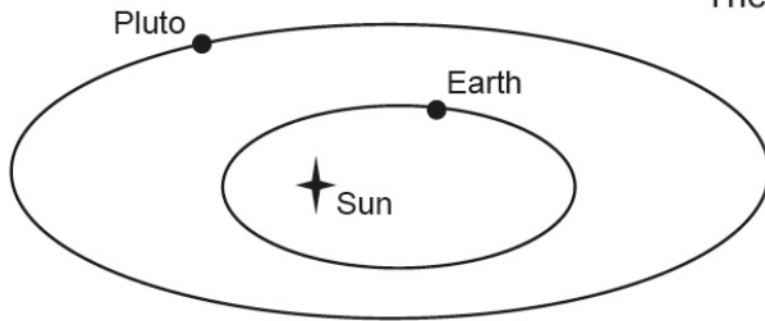
$$\begin{aligned} (4.44 \times 10^9) &\div (1.47 \times 10^8) \\ &= 30.2 \approx 30 \checkmark \end{aligned}$$

$\frac{4.44}{1.47}$

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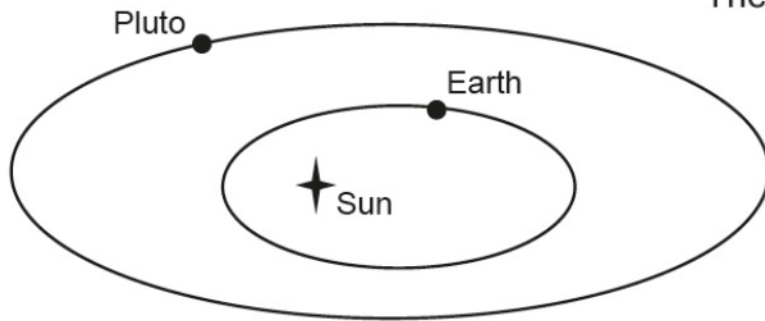
.....

..... [1]

22 Earth and Pluto go around the Sun.
Their distance to the Sun varies.

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The table shows the closest distance that Earth and Pluto get to the Sun.



	Closest distance to the Sun (km)
Earth	1.47×10^8
Pluto	4.44×10^9

(b) Give a reason why we **cannot** use this information to say

The distance of Pluto to the Sun is always
30 times the distance of Earth to the Sun.

Distances change as earth and Pluto orbit the
SUN

[1]

13 (a) Write 0.003 16 in standard form.

N47

(a) [1]

(b) Work out.

N48 $2 \times 10^2 \times 4 \times 10^5$

Give your answer in standard form.

(b) [2]

13 (a) Write 0.003,16 in standard form.

N47

(a) 3.16×10^{-3} [1]

(b) Work out.

N48

$$\underline{2 \times 10^2} \times 4 \times 10^5$$

Give your answer in standard form.

$$2 \times 10^2 = 200$$

100

$$4 \times 10^5 = 400000$$

$$\begin{array}{r} 200 \times 400000 \\ \hline = 80000000 \end{array}$$

(b) 8×10^7 [2]

- 1 This table shows the populations of the four countries of the UK in 2012.
All values are given correct to 3 significant figures.

Country	Population
England	5.35×10^7
Wales	3.07×10^6
Scotland	5.31×10^6
Northern Ireland	1.82×10^6

- (a) Write the population of England as an ordinary number.

(a) [1]

- (b) Work out the total population of Wales, Scotland and Northern Ireland.
Give your answer in standard form.

(b) [2]

- 1 This table shows the populations of the four countries of the UK in 2012.
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Country	Population
England	5.35×10^7
Wales	3.07×10^6
Scotland	5.31×10^6
Northern Ireland	1.82×10^6

- (a) Write the population of England as an ordinary number.

N47

(a) 53500000 [1]

- (b) Work out the total population of Wales, Scotland and Northern Ireland.

N48 Give your answer in standard form.

$10,200,000$

(b) 1.02×10^7 [2]

Edexcel

26 (a) Write 2.673×10^4 as an ordinary number.

.....
(1)

(b) Write 0.0704 in standard form.

.....
(1)

(c) Calculate $(4.515 \times 10^6) \div (3.01 \times 10^{-2})$
Give your answer in standard form.

.....
(2)

(Total for Question 26 is 4 marks)

26 (a) Write 2.673×10^4 as an ordinary number.

26730 ✓

.....
(1)

(b) Write 0.0704 in standard form.

7.04×10^{-2}

.....
(1)

(c) Calculate $(4.515 \times 10^6) \div (3.01 \times 10^{-2})$
Give your answer in standard form.

1.5×10^8

.....
(2)

(Total for Question 26 is 4 marks)

22 (a) Write 1.04×10^5 as an ordinary number.

N47

.....
(1)

(b) Write 0.06 in standard form.

N47

.....
(1)

22 (a) Write 1.04 $\times 10^5$ as an ordinary number.

N47

104000

104000

(1)

(b) Write 0.06 in standard form.

N47

0.06

6×10^{-2}

(1)

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15 (a) Write 4.7×10^{-1} as an ordinary number.

.....
(1)

(b) Work out the value of $(2.4 \times 10^3) \times (9.5 \times 10^5)$
Give your answer in standard form.

15 (a) Write 4.7×10^{-1} as an ordinary number.

$$0.47 \quad \text{-----} \quad (1)$$

(b) Work out the value of $(2.4 \times 10^3) \times (9.5 \times 10^5)$
Give your answer in standard form.

$$22800000000$$

$$2.28 \times 10^9 \checkmark$$

18 Work out the value of $\frac{2.645 \times 10^9}{1.15 \times 10^3}$

Give your answer in standard form.

N47
N48

.....
(Total for Question 18 is 2 marks)

18 Work out the value of $\frac{2.645 \times 10^9}{1.15 \times 10^3}$

Give your answer in standard form.

N47
N48

23000000

2.3×10^6

(Total for Question 18 is 2 marks)

27 (a) Write the number 0.000 075 47 in standard form.

N47

.....
(1)

(b) Write 3.42×10^4 as an ordinary number.

N47

.....
(1)

27 (a) Write the number $0.\overset{\text{mm}}{000}07547$ in standard form.

N47

$$7.547 \times 10^{-5}$$

(1)

(b) Write 3.42×10^4 as an ordinary number.

N47

$$34200$$

(1)

7 (a) Write 0.005 49 in standard form.

.....
(1)

(b) Find the value of $(8 \times 10^3)^2$
Give your answer in standard form.

.....
(2)

(c) Find the value of $(7.6 \times 10^5) + (8.7 \times 10^4)$
Give your answer in standard form.

.....
(2)

7 (a) Write 0.00549 in standard form.

$$\underline{5.49 \times 10^{-3}}$$

(1)

(b) Find the value of $(8 \times 10^3)^2$
Give your answer in standard form.

$$(8 \times 10^3) \times (8 \times 10^3)$$

$$\underline{64 \times 10^6}$$

$$\underline{6.4 \times 10^7}$$

(2)

(c) Find the value of $(7.6 \times 10^5) + (8.7 \times 10^4)$
Give your answer in standard form.

$$\begin{array}{r} 760000 + 87000 \\ + 187000 \\ \hline 847000 \end{array}$$

$$\underline{8.47 \times 10^5}$$

(2)

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8 (a) Write 7.97×10^{-6} as an ordinary number.

.....
(1)

(b) Work out the value of $(2.52 \times 10^5) \div (4 \times 10^{-3})$
Give your answer in standard form.

.....
(2)

(Total for Question 8 is 3 marks)

8 (a) Write 7.97×10^{-6} as an ordinary number.

0.00000797

0.00000797

(1)

(b) Work out the value of $(2.52 \times 10^5) \div (4 \times 10^{-3})$
Give your answer in standard form.

$$4 \overline{) 2.52} \begin{array}{r} 0.63 \\ \underline{2.52} \\ 0 \end{array}$$

0.63 ✓

$$10^5 \div 10^{-3}$$

$$5 - -3$$

$$5 + 3 = 8$$

$$= 10^8$$

$$\begin{array}{l} \xrightarrow{\quad} \\ 0.63 \times 10^8 \\ 6.3 \times 10^7 \end{array}$$

$$\underline{6.3 \times 10^7}$$

(2)

(Total for Question 8 is 3 marks)

10 The table shows some information about eight planets.

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Planet	Distance from Earth (km)	Mass (kg)
Earth	0	5.97×10^{24}
Jupiter	6.29×10^8	1.898×10^{27}
Mars	7.83×10^7	6.42×10^{23}
Mercury	9.17×10^7	3.302×10^{23}
Neptune	4.35×10^9	1.024×10^{26}
Saturn	1.28×10^9	5.68×10^{26}
Uranus	2.72×10^9	8.683×10^{25}
Venus	4.14×10^7	4.869×10^{24}

(a) Write down the name of the planet with the greatest mass.

.....
(1)

(b) Find the difference between the mass of Venus and the mass of Mercury.

10 The table shows some information about eight planets.

Video created by W Neill

Planet	Distance from Earth (km)	Mass (kg)
Earth	0	5.97×10^{24}
Jupiter	6.29×10^8	1.898×10^{27}
Mars	7.83×10^7	6.42×10^{23}
Mercury	9.17×10^7	3.302×10^{23}
* Neptune	4.35×10^9	1.024×10^{26}
Saturn	1.28×10^9	5.68×10^{26}
Uranus	2.72×10^9	8.683×10^{25}
* Venus	4.14×10^7	4.869×10^{24}

Nishat says that Neptune is over a hundred times further away from Earth than Venus is.

(c) Is Nishat right?

You must show how you get your answer.

Yes, it is 105 times further away.

earth $\begin{matrix} \nearrow 4.35 \times 10^9 \\ \searrow 4.14 \times 10^7 \end{matrix} \left. \vphantom{\begin{matrix} \nearrow \\ \searrow \end{matrix}} \right\} \div 105$

7 (a) Write the number 0.000 086 23 in standard form.

N47

.....
(1)

(b) Work out $\frac{3.2 \times 10^3 + 5.1 \times 10^{-2}}{4.3 \times 10^{-4}}$

N48

Give your answer in standard form, correct to 3 significant figures.

.....
(2)

(Total for Question 7 is 3 marks)

7 (a) Write the number 0.00008623 in standard form.

N47

$$8.623 \times 10^{-5}$$

(1)

(b) Work out $\frac{3.2 \times 10^3 + 5.1 \times 10^{-2}}{4.3 \times 10^{-4}}$

N48

Give your answer in standard form, correct to 3 significant figures.

$$7441979$$

$$7440000$$

$$7.44 \times 10^6$$

(2) ✓

(Total for Question 7 is 3 marks)

AQA

18 Write the number six million five thousand two hundred in standard form.

[2 marks]

N47

Answer _____

Write the number six million five thousand two hundred in standard form.

[2 marks]

N47

6,005,200

$$6.0052 \times 10^6$$

Answer _____

27 Write these numbers in **descending** order.

N47

9563

9.56×10^3

9.56×3^{10}

[2 marks]

Answer _____ , _____ , _____

Write these numbers in **descending** order.

N47

9563

9.56×10^3

9.56×3^{10}

9560

564508

[2 marks]

Answer

9.56×3^{10}

9563

9.56×10^3

28 (a) Write in standard form 12 500

N47

[1 mark]

Answer _____

28 (b) Write as an ordinary number 3.4×10^{-2}

N47

[1 mark]

Answer _____

28 (a) Write in standard form 12 500

[1 mark]

N47

Answer 1.25 × 10⁴

28 (b) Write as an ordinary number 3.4×10^{-2}

[1 mark]

N47

Answer 0.034 ✓

32 Put these numbers in order from smallest to largest.

N47

8×10^{-4}

4×10^{-2}

6×10^{-4}

0.07

[2 marks]

Smallest _____

Largest _____

32

Put these numbers in order from smallest to largest.

N47

$$8 \times 10^{-4} \quad 4 \times 10^{-2} \quad 6 \times 10^{-4} \quad 0.07$$

0.0008 0.04 0.0006 0.07

[2 marks]

Smallest

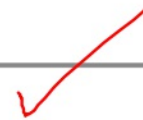
$$6 \times 10^{-4}$$

$$8 \times 10^{-4}$$

$$4 \times 10^{-2}$$

Largest

$$0.07$$



2 Which of these values of n makes 2.7×10^n a cube number?

Circle your answer.

[1 mark]

0

1

2

3

2 Which of these values of n makes 2.7×10^n a cube number?

N47

N19

Circle your answer.

[1 mark]

0

1

2

3

$$2.7 \times 10^1 = 2.7 \times 10$$

$$3 \times 3 \times 3 = 27$$

2 What is 800 million in standard form?
Circle your answer.

N47

[1 mark]

800×10^6

8×10^8

8×10^9

0.8×10^{10}

2 What is 800 million in standard form?
Circle your answer.

N47

[1 mark]

800×10^6

8×10^8

8×10^9

0.8×10^{10}

800 000 000

$8. \times 10^8$

2 Circle the number that is in standard form.

[1 mark]

N47

0.25×10^4

6×10^7

38×10^{-3}

$4 \times 10^{\frac{1}{2}}$

2 Circle the number that is in standard form.

[1 mark]

N47

$$0.25 \times 10^4$$

X

$$6 \times 10^7$$

=

$$38 \times 10^{-3}$$

X

$$4 \times 10^{\frac{1}{2}}$$