

Standard form with large numbers

Year 7 About 60 minutes No calculator 46 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-7-standard-form-with-large-numbers/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] Write $10 \times 10 \times 10 \times 10 \times 10$ as a power of 10.
- A2** Needed today [1 mark] Work out 4.06×10^3 .

Answer

Answer

- A3** Last lesson [1 mark] Round 7352 to 2 significant figures.
- A4** From chapter 1 [1 mark] Work out $(-6) \times (-9)$.

Answer

Answer

B Example, then your turn

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Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

Write each number in standard form.

(a) 640 000 (b) 93 080

Hint Standard form is $a \times 10^n$, where a is at least 1 and less than 10. Count how many places the digits move to give a number between 1 and 10.

- B1**
- Write each number in standard form. [2 marks]

(a) 5 720 000 (b) 408

Answer (a) (b)

EXAMPLE 2

Write each number as an ordinary number.

(a) 3.9×10^6 (b) 7.025×10^4

Hint Multiply by the power of 10: the digits move that many places to the left. Fill the empty places with zeros.

- B2**
- Write each number as an ordinary number. [2 marks]

(a) 6.14×10^5 (b) 2.3×10^8

Answer (a) (b)

EXAMPLE 3

These numbers are not in standard form.
Write each one in standard form.

(a) 46×10^5 (b) 0.52×10^7

Hint Make the front number between 1 and 10. If you divide it by 10, multiply the power of 10 by 10 (add 1 to the power). If you multiply it by 10, take 1 off the power.

B3 Write each number in standard form. [2 marks]

(a) 730×10^4 (b) 0.081×10^9

Answer (a) (b)

EXAMPLE 4

Write each number in standard form.

(a) 4.6 million (b) 52 billion

Hint One million is $1\,000\,000 = 10^6$. One billion is one thousand million, $1\,000\,000\,000 = 10^9$.

B4 Write each number in standard form. [2 marks]

(a) 830 thousand (b) 6.15 billion

Answer (a) (b)

EXAMPLE 5

Work out the square of each number. Give each answer in standard form.

(a) 6000 (b) 90 000

Hint Square the non-zero part, then count the zeros: a number with 3 zeros squared has 6 zeros.

B5 Work out the square of each number. Give each answer in standard form. [2 marks]

(a) 500 (b) 120 000

Answer (a) (b)

c Practice

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C1 Which of these numbers are written in standard form? [2 marks]

3.2×10^5 12×10^3
 9.99×10^7 1×10^4 0.8×10^6

Answer

C2 Write these numbers in order of size. Start with the smallest. [2 marks]

4.1×10^6 9.8×10^5
 2.6×10^7 3.95×10^6

Answer

C3 A calculator shows 5.07E08. This [1 mark]
means 5.07×10^8 .

Write the number as an ordinary number.

Answer

C4 Write down the missing [2 marks]
numbers.

(a) $57\,000\,000 = 5.7 \times 10^{\square}$

(b) $\square \times 10^4 = 26\,000$

Answer (a) (b)

C5 (a) How many zeros does [2 marks]
 8×10^{11} have when it is written
as an ordinary number?

(b) How many digits does
 8.42×10^{11} have when it is
written as an ordinary number?

Answer (a) (b)

D Exam-style questions

GCSE Foundation

D1 Answer each part.

(a) Write 36 400 in standard form. [1 mark]

Answer

(b) Write 5.09×10^6 as an ordinary number. [1 mark]

Answer

(c) Write 0.27×10^8 in standard form. [1 mark]

Answer

Total for D1: 3 marks

D2 Sami says, " 9×10^6 is bigger than 4.5×10^7 , because 9 is bigger than 4.5." [2 marks]

Is Sami right? Give a reason for your answer.

Answer

D3 The table shows the number of visits to four websites in one year.

- (a) Which website had the most visits? [1 mark]

Answer

- (b) Write the number of visits to Site B as an ordinary number. [1 mark]

Answer

Website	Visits in one year
Site A	3.4×10^7
Site B	8.6×10^6
Site C	1.25×10^8
Site D	9.1×10^7

- (c) Work out how many more visits Site A had than Site B. Give your answer in standard form. [3 marks]

Answer

Total for D3: 5 marks

D4 A solar farm is a square of side 4000 m.

- (a) Work out the area of the solar farm in m^2 . Give your answer in standard form. [2 marks]

Answer

- (b) One hectare is 10 000 m^2 . Work out the area of the solar farm in hectares. [2 marks]

Answer

Total for D4: 4 marks

D5 Add 4×10^3 and 6×10^5 . Give your answer in standard form. [2 marks]

Answer

D6 Write down the value of n in each.

(a) $840\,000 = 8.4 \times 10^n$

[1 mark]

Answer

(b) 56 million $= 5.6 \times 10^n$

[1 mark]

Answer

Total for D6: 2 marks

E Extension

Stretch

No route is given. The hints are at the end of the sheet. Use one at a time.

E1 $N = 2^{10} \times 5^{13}$

[5 marks]

Write N in standard form. How many digits does N have when it is written as an ordinary number?

Answer $N = \dots\dots\dots$ digits $\dots\dots\dots$

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** $2 \times 5 = 10$. Pair each 2 with a 5.
- Hint 2** $2^{10} \times 5^{13} = 2^{10} \times 5^{10} \times 5^3 = 10^{10} \times 125$.
- Hint 3** $125 \times 10^{10} = 1.25 \times 10^2 \times 10^{10} = 1.25 \times 10^{12}$. As an ordinary number it is 125 followed by 10 zeros, so it has 13 digits.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can write a large number in standard form. ☐ ☐ ☐

I can write a number in standard form as an ordinary number. ☐ ☐ ☐

I can change a number like 46×10^5 into standard form. ☐ ☐ ☐

I can compare and order numbers in standard form. ☐ ☐ ☐