

Multiplying with numbers in standard form

Year 7 About 60 minutes Calculator allowed 47 marks



Hints online, answers free with an account:

mathswariz.uk/worksheets/ks3-year-7-multiplying-with-numbers-in-standard-form/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] **A2** Needed today [1 mark]
- Write 72 000 in standard form. Write $10^3 \times 10^5$ as a single power of 10.

Answer

Answer

- A3** Last lesson [1 mark] **A4** From chapter 6 [1 mark]
- Write 3.08×10^5 as an ordinary number. How many cm^3 are there in 1 litre?

Answer

Answer

B Example, then your turn

Year 7

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

EXAMPLE 1

Work out each calculation. Give your answers in standard form. Do not use a calculator.

(a) $(2 \times 10^3) \times (4 \times 10^5)$

(b) $(1.3 \times 10^2) \times (3 \times 10^6)$

Hint Multiply the front numbers. Multiply the powers of 10 by adding the powers: $10^3 \times 10^5 = 10^8$.

- B1** Give your answers in standard form. Do not use a calculator. [2 marks]

(a) $(3 \times 10^4) \times (3 \times 10^2)$

(b) $(1.6 \times 10^5) \times (4 \times 10^3)$

Answer (a) (b)

EXAMPLE 2

Give your answers in standard form. Do not use a calculator.

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

(b) $(8 \times 10^2)^2$

Hint If the front numbers multiply to 10 or more, the answer is not yet in standard form. Write the front number as a number between 1 and 10 times 10, and add 1 to the power.

- B2** Give your answers in standard form. Do not use a calculator. [2 marks]

(a) $(7 \times 10^5) \times (4 \times 10^6)$

(b) $(9 \times 10^3)^2$

Answer (a) (b)

EXAMPLE 3

Work out $(25 \times 10^3) \times (3 \times 10^5)$. Give your answer in standard form. Do not use a calculator.

Hint You can multiply first and change to standard form at the end.

B3 Give your answers in standard form. Do not use a calculator. [2 marks]

(a) $(0.7 \times 10^5) \times (4 \times 10^2)$

(b) $(15 \times 10^3) \times (6 \times 10^4)$

Answer (a) (b)

EXAMPLE 4

Use a calculator to work out $(4.27 \times 10^5) \times (6.83 \times 10^3)$. Give your answer in standard form, correct to 3 significant figures.

Hint Enter 4.27×10^5 with the $\times 10^x$ key (or EXP), not with the $\times$ key. Then round the front number.

B4 Use a calculator to work out $(5.96 \times 10^4) \times (3.18 \times 10^6)$. [2 marks]

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

Answer

EXAMPLE 5

Sound travels 3.4×10^2 metres each second. How far does sound travel in 1 hour? Give your answer in standard form.

Hint Change 1 hour into seconds first:
 $60 \times 60 = 3600 = 3.6 \times 10^3$.

B5 A machine prints 2.5×10^3 labels each minute. It runs for 8 hours. How many labels does it print? Give your answer in standard form. [3 marks]

Answer

c Practice

Year 7

C1 Work out $(1.25 \times 10^6) \times (8 \times 10^3)$. Give your answer in standard form. Do not use a calculator. [2 marks]

Answer

C2 Write down the missing numbers. [2 marks]

(a) $(4 \times 10^{\square}) \times (2 \times 10^5) = 8 \times 10^{11}$

(b) $(\square \times 10^3) \times (5 \times 10^4) = 1.5 \times 10^8$

Answer (a) (b)

C3 Use a calculator to work out $(7.04 \times 10^3)^2$. Give your answer in standard form, correct to 3 significant figures. [2 marks]

Answer

C4 Work out $4 \text{ million} \times 3 \text{ thousand}$. Give your answer in standard form. [2 marks]

Answer

C5 Which is larger, $(3 \times 10^4) \times (2 \times 10^5)$ or $(5 \times 10^3) \times (1.4 \times 10^6)$? Show how you decide. [2 marks]

Answer

D Exam-style questions

GCSE Foundation

D1 Work out each calculation. Give your answers in standard form.

(a) $(4 \times 10^6) \times (2 \times 10^3)$ [1 mark]

Answer

(b) $(9 \times 10^5) \times (6 \times 10^2)$ [2 marks]

Answer

Total for D1: 3 marks

D2 Leah works out $(5 \times 10^4) \times (6 \times 10^3)$. She writes 30×10^7 and says her answer is in standard form. [2 marks]

Explain why Leah is wrong. Write her answer in standard form.

Answer

D3 A camera takes 2.5×10^3 photos. Each photo uses 4.8×10^6 bytes of memory.

(a) Work out the total number of bytes the photos use. Give your answer in standard form. [2 marks]

Answer

(b) One gigabyte is 10^9 bytes. How many gigabytes do the photos use? [1 mark]

Answer

(c) Ravi's memory card holds 16 gigabytes. Will all the photos fit on it? Give a reason for your answer. [2 marks]

Answer

Total for D3: 5 marks

D4 A spacecraft travels 1.1×10^4 metres every second.

(a) Show that there are 8.64×10^4 seconds in one day. [2 marks]

Answer

(b) Work out how far the spacecraft travels in one day. Give your answer in metres, in standard form, correct to 3 significant figures. [2 marks]

Answer

Total for D4: 4 marks

D5 Use a calculator to work out $(6.25 \times 10^7) \times (3.9 \times 10^4)$.

(a) Give your answer in standard form. Do not round your answer. [2 marks]

Answer

(b) Write your answer to part (a) correct to 2 significant figures. [1 mark]

Answer

Total for D5: 3 marks

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

E1 a , b and c are three whole numbers in a row, with $a < b < c$. [5 marks]

$$(6 \times 10^a) \times (8 \times 10^b) \times (5 \times 10^c) = 2.4 \times 10^{20}$$

Find a , b and c .

Answer $a = \dots$ $b = \dots$ $c = \dots$

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Multiply the front numbers first and write the result in standard form.
- Hint 2** $6 \times 8 \times 5 = 240 = 2.4 \times 10^2$, so $10^2 \times 10^{a+b+c} = 10^{20}$.
- Hint 3** So $a + b + c = 18$. Three whole numbers in a row that add to 18 are 5, 6 and 7.

How did it go?

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

I can multiply numbers in standard form without a calculator. ☐ ☐ ☐

I can write an answer like 30×10^7 in standard form. ☐ ☐ ☐

I can multiply numbers in standard form on a calculator and round. ☐ ☐ ☐

I can use standard form in a problem with units. ☐ ☐ ☐