

GCSE Maths: Standard form: large and small numbers (Foundation): answers

GCSE Maths - Standard Form, Indices and Surds - Foundation - Lesson 6.4

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch06-standard-form-indices-surds/foundation/standard-form-large-and-small-numbers/

Exercise 6I Writing numbers in standard form Non-calculator

1 Is each number in standard form? Give a reason.

(a) 3.4×10^5

Answer: Yes

(b) 34×10^4

Answer: No (A is 10 or more)

(c) 0.5×10^3

Answer: No (A is less than 1)

(d) 9.99×10^{-2}

Answer: Yes

(e) 10×10^2

Answer: No (A is 10 or more)

(f) 6×10^0

Answer: Yes

2 Write each number in standard form.

(a) 6000

Answer: 6×10^3

(b) 45,000

Answer: 4.5×10^4

(c) 380,000

Answer: 3.8×10^5

(d) 5,600,000

Answer: 5.6×10^6

(e) 91,000,000

Answer: 9.1×10^7

(f) 720

Answer: 7.2×10^2

3 Write each number in standard form.

(a) 0.7

Answer: 7×10^{-1}

(b) 0.06

Answer: 6×10^{-2}

(c) 0.0035

Answer: 3.5×10^{-3}

(d) 0.00072

Answer: 7.2×10^{-4}

(e) 0.000081

Answer: 8.1×10^{-5}

(f) 0.0000046

Answer: 4.6×10^{-6}

4 Write each as an ordinary number.

(a) 5×10^3

Answer: 5000

(b) 2.4×10^4

Answer: 24,000

(c) 7.08×10^5

Answer: 708,000

(d) 1.5×10^6

Answer: 1,500,000

(e) 9.2×10^7

Answer: 92,000,000

5 Write each as an ordinary number.

(a) 4×10^{-1}

Answer: 0.4

(b) 6.2×10^{-3}

Answer: 0.0062

(c) 3.07×10^{-4}

Answer: 0.000307

(d) 8.5×10^{-5}

Answer: 0.000085

(e) 1.1×10^{-6}

Answer: 0.0000011

6 These numbers are **not** in standard form. Write each in standard form.

(a) 45×10^3

Answer: 4.5×10^4

(b) 0.6×10^5

Answer: 6×10^4

(c) 120×10^{-4}

Answer: 1.2×10^{-2}

(d) 0.08×10^7

Answer: 8×10^5

(e) 250×10^2

Answer: 2.5×10^4

7 A calculator display shows each of these. Write the value in standard form and as an ordinary number.

(a) 3.6E8

Answer: $3.6 \times 10^8 = 360,000,000$

(b) 2.4E-3

Answer: $2.4 \times 10^{-3} = 0.0024$

(c) 7.1E5

Answer: $7.1 \times 10^5 = 710,000$

(d) 5E-2

Answer: $5 \times 10^{-2} = 0.05$

8 Write each number in standard form, correct to the number of significant figures shown.

(a) 4,523,000 (2 s.f.)

Answer: 4.5×10^6

(b) 0.0003846 (2 s.f.)

Answer: 3.8×10^{-4}

- 14 Which of these is **not** equal to 3.5×10^4 ? A: 35,000 B: 350×10^2 C: 0.35×10^5 D: 3.5×10^{-4}

Answer: D

- 15 The number 7.2×10^n is greater than 500 and less than 50,000. List all the possible whole-number values of n .

Answer: $n = 2$ or $n = 3$

Exercise 6J Standard form in context Non-calculator

1 Write each measurement in standard form.

- (a) The diameter of the Sun is 1,392,000 km.

Answer: 1.392×10^6

- (b) The wavelength of red light is 0.0000007 m.

Answer: 7×10^{-7}

- (c) The population of the UK is about 67,000,000.

Answer: 6.7×10^7

- (d) A human hair is about 0.00007 m wide.

Answer: 7×10^{-5}

- (e) The nearest star is about 40,000,000,000,000 km away.

Answer: 4×10^{13}

2 Write each of these as an ordinary number.

- (a) The Earth is 1.5×10^8 km from the Sun.

Answer: 150,000,000

- (b) A virus is 1.2×10^{-7} m long.

Answer: 0.00000012

- (c) A computer can do 3×10^9 operations per second.

Answer: 3,000,000,000

- (d) A grain of pollen has a mass of 2.5×10^{-9} kg.

Answer: 0.0000000025

3 Write each of these numbers in standard form.

- (a) 85,000

Answer: 8.5×10^4

- (b) 0.0092

Answer: 9.2×10^{-3}

(c) 630,000,000

Answer: 6.3×10^8

(d) 0.00000058

Answer: 5.8×10^{-7}

(e) 1,200,000,000

Answer: 1.2×10^9

4 Write each number as an ordinary number.

(a) 6.3×10^4

Answer: 63,000

(b) 9×10^{-3}

Answer: 0.009

(c) 1.07×10^6

Answer: 1,070,000

(d) 4.4×10^{-2}

Answer: 0.044

5 Write each number in standard form.

(a) 32×10^6

Answer: 3.2×10^7

(b) 0.45×10^3

Answer: 4.5×10^2

(c) 560×10^{-5}

Answer: 5.6×10^{-3}

(d) 0.09×10^4

Answer: 9×10^2

6 Zoe says: " 50×10^4 is bigger than 5×10^4 , so it must be in standard form." Is she right? Explain.

Answer: No. $A = 50$ is not less than 10. In standard form it is 5×10^5 .

7 A scientist measures a bacterium as 0.0000025 m long. She writes 25×10^{-7} m. Write this correctly in standard form.

Answer: 2.5×10^{-6} m

8 Show that 3×10^5 is 100 times bigger than 3×10^3 .

Answer: $3 \times 10^5 \div (3 \times 10^3) = 10^2 = 100$

