

GCSE Maths: Comparing and calculating with standard form (Foundation): worksheet

GCSE Maths - Standard Form, Indices and Surds - Foundation - Lesson 6.5

Name: _____

Date: _____

Score: _____

29 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch06-standard-form-indices-surds/foundation/comparing-and-calculating-with-standard-form/

Exercise 6K Comparing and ordering standard form Non-calculator

1 Write down the larger number in each pair.

(a) 3.2×10^5 and 9.9×10^4

Answer: _____

(b) 4.5×10^{-3} and 4.5×10^{-5}

Answer: _____

(c) 6.1×10^7 and 6.8×10^7

Answer: _____

(d) 2×10^{-6} and 9×10^{-7}

Answer: _____

(e) 1.2×10^{10} and 9.9×10^9

Answer: _____

2 Put < or > between each pair.

(a) 7.5×10^3 ? 2.1×10^6

Answer: _____

(b) 3.3×10^{-2} ? 1.9×10^{-4}

Answer: _____

(c) 5.6×10^8 ? 5.1×10^8

Answer: _____

(d) 9×10^{-5} ? 1×10^{-4}

Answer: _____

3 Write each list in order, **smallest first**.

(a) 2.5×10^4 , 7.1×10^{-3} , 2.1×10^4 , 9×10^3

Answer: _____

(b) 5.2×10^{-6} , 4.9×10^{-5} , 1.1×10^{-5} , 8×10^{-7}

Answer: _____

4 Write this list in order, **largest first**: 6×10^8 , 6×10^{-8} , 5.9×10^8 , 1×10^9 .

Answer:

- 5** The distances of four planets from the Sun, in km, are: Mercury 5.79×10^7 , Venus 1.08×10^8 , Earth 1.5×10^8 , Mars 2.28×10^8 . Write the planets in order, closest to the Sun first.

Answer:

- 6** The mass of an electron is 9.11×10^{-31} kg. The mass of a proton is 1.67×10^{-27} kg. Which has the smaller mass?

Answer:

- 7** Explain why 9.9×10^2 is less than 1.1×10^5 , even though 9.9 is bigger than 1.1.

Answer:

- 8** Write down a number in standard form that is bigger than 3×10^4 and smaller than 3×10^5 .

Answer:

- 9** True or false: $5 \times 10^{-3} > 5 \times 10^{-2}$? Explain.

Answer:

Exercise 6L Calculating with standard form (no calculator)

Non-calculator

- 1** Work out each multiplication. Give your answers in standard form.

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

Answer:

(b) $(4 \times 10^5) \times (2 \times 10^{-2})$

Answer:

(c) $(1.5 \times 10^6) \times (4 \times 10^3)$

Answer:

(d) $(2.5 \times 10^{-3}) \times (4 \times 10^{-2})$

Answer:

(e) $(3 \times 10^8) \times (3 \times 10^{-5})$

Answer:

- 2** Work out each division. Give your answers in standard form.

(a) $(8 \times 10^9) \div (2 \times 10^4)$

Answer:

(b) $(6 \times 10^7) \div (3 \times 10^{-2})$

Answer:

(c) $(9 \times 10^5) \div (4 \times 10^2)$

Answer:

(d) $(3 \times 10^5) \div (5 \times 10^{-2})$

Answer:

(e) $(4.5 \times 10^{-3}) \div (1.5 \times 10^2)$

Answer:

(f) $(1.2 \times 10^6) \div (4 \times 10^{-2})$

Answer:

3 Work out each. Give your answers in standard form.

(a) $(3.2 \times 10^4) + (8.5 \times 10^3)$

Answer:

(b) $(5.2 \times 10^6) + (4.1 \times 10^6)$

Answer:

(c) $(6 \times 10^5) - (2.5 \times 10^4)$

Answer:

(d) $(7.2 \times 10^{-3}) - (3.1 \times 10^{-3})$

Answer:

(e) $(9.5 \times 10^7) + (7.5 \times 10^6)$

Answer:

(f) $(5.2 \times 10^4) - (4.9 \times 10^4)$

Answer:

4 A rectangular field is 3×10^4 m long and 2×10^3 m wide. Work out its area in standard form.

Answer:

5 A printer prints 4×10^3 pages every hour. How many pages does it print in 5×10^2 hours?

Answer:

6 A grain of sand has a mass of 2.5×10^{-5} kg. How many grains of sand are in 1 kg? Give your answer in standard form.

Answer:

7 A country has a population of 6×10^7 . Each person uses 1.5×10^2 litres of water a day. How many litres does the whole country use in a day?

Answer:

8 A company earned $\text{£}3.6 \times 10^6$ in 2020 and $\text{£}5.2 \times 10^6$ in 2021. Work out the total it earned over the two years.

Answer:

9 Sam writes: $3 \times 10^4 + 2 \times 10^3 = 5 \times 10^7$. Is he correct? Show the correct answer.

Answer:

10 Show that $(2 \times 10^3) \times (5 \times 10^4)$ is 1×10^8 , and explain why you have to change the front number.

Answer:

Exercise 6M Calculator questions and context

Calculator allowed

1 Use a calculator to work out each. Give your answers in standard form to 3 significant figures.

(a) $(4.5 \times 10^7) \times (2.4 \times 10^{-3})$

Answer:

(b) $(5.97 \times 10^{24}) \div (7.35 \times 10^{22})$

Answer:

(c) $(3.2 \times 10^5) \times (4.7 \times 10^{-2}) \div (1.6 \times 10^4)$

Answer:

(d) $(6.84 \times 10^8) + (3.9 \times 10^9)$

Answer:

2 Work out each. Give your answers in standard form to 3 significant figures.

(a) $(2.7 \times 10^4)^2$

Answer:

(b) $\sqrt{8.1 \times 10^7}$

Answer:

(c) $(9.2 \times 10^{-3}) - (3.7 \times 10^{-4})$

Answer:

3 Light travels at 3×10^8 m/s. The Sun is 1.496×10^{11} m from the Earth. How many seconds does light take to reach the Earth? Give your answer to 3 significant figures in standard form.

Answer:

4 The mass of the Earth is 5.97×10^{24} kg and the mass of the Moon is 7.35×10^{22} kg. How many times heavier is the Earth than the Moon? Give your answer in standard form to 3 significant figures.

Answer:

5 A region has an area of 2.4×10^5 km² and a population of 6.7×10^7 . Work out the population density (people per km²) to 3 significant figures in standard form.

Answer:

6 A memory card holds 2×10^{12} bytes. One photo uses 3.5×10^6 bytes. How many photos fit on the card? Give your answer to 3 significant figures in standard form.

Answer:

7 There are 6.02×10^{23} atoms in one mole of a substance. How many atoms are there in 3.5 moles? Give your answer to 3 significant figures in standard form.

Answer:

8 Jupiter has a diameter of 1.43×10^5 km. The Earth has a diameter of 1.27×10^4 km. How much bigger is the diameter of Jupiter? Give your answer to 3 significant figures in standard form.

Answer:

9 The galaxy Andromeda is 2.5×10^6 light-years away. One light-year is 9.46×10^{12} km. How far away is Andromeda in km? Give your answer to 3 significant figures in standard form.

Answer:

10 Show, by estimating, that $(3.9 \times 10^5) \times (2.1 \times 10^{-2})$ is approximately 8×10^3 .

Answer:

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