IGCSE · Cambridge (CIE) · Maths

45 mins 26 questions

Non-Calculator Questions

Powers, Roots & Standard Form

Powers & Roots / Laws of Indices / Converting to & from Standard Form / Operations with Standard Form

Easy (13 questions)	/15
Medium (6 questions)	/11
Hard (7 questions)	/19
Total Marks	**/45**

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Easy Questions

1 The Earth has a surface area of approximately 510 100 000 km^2.

Write this surface area in standard form.

..... km^2

(1 mark)

2 Write 15 060 in standard form.

(1 mark)

3 Write each number in standard form.

i) 72 000

[1]

ii) 0.0018

[1]

(2 marks)

4 Write 0.00527 in standard form.

(1 mark)

5 Write 2 760 000 in standard form.

(1 mark)

6 Write 23 000 in standard form.

(1 mark)

7 Write 0.00813 in standard form.

(1 mark)

8 Write 0.0000387 in standard form.

(1 mark)

9 Here are some numbers written in standard form

3.4×10^{-1} 1.36×10^{6} 7.9×10^{0} 2.4×10^{5} 5.21×10^{-3} 4.3×10^{-2}

From these numbers, write down;

i) the largest number,

[1]

ii) the smallest number.

[1]

(2 marks)

10 Write 4.82×10^{-3} as an ordinary number.

(1 mark)

11 Write 52 million in standard form.

(1 mark)

12 Write 0.0000523 in standard form.

(1 mark)

13 Write 19500000 in standard form.

(1 mark)

Medium Questions

1 Work out, giving your answer in standard form,

$(5.2 \times 10^7) + (5.2 \times 10^6)$.

(2 marks)

2 Work out $(3 \times 10^{199}) + (2 \times 10^{201})$.

Give your answer in standard form.

(2 marks)

3 Work out $(6.4 \times 10^7) + (9.6 \times 10^6)$.
Give your answer in standard form.

(2 marks)

4 Write the following numbers in order of size. Start with the smallest number.

0.038×10^2 3800×10^{-4} 380 0.38×10^{-1}

(2 marks)

5 Work out the value of $(9 \times 10^{-4}) \times (3 \times 10^7)$

Give your answer in standard form.

(2 marks)

6 Patrick has to work out the exact value of $64^{\frac{1}{4}}$

Patrick says,

"$\frac{1}{4}$ of 64 is 16 so $64^{\frac{1}{4}}$ = 16"

Explain what is wrong with what Patrick says.

(1 mark)

Hard Questions

1 Find the value of $64^{\frac{2}{3}}$.

(2 marks)

2 Calculate $0.125^{-\frac{2}{3}}$.

(3 marks)

3 Work out

$$\left(\frac{125}{27}\right)^{-\frac{2}{3}}$$

(3 marks)

4 Find the value of $\left(\frac{1}{81}\right)^{-\frac{3}{4}}$.

(2 marks)

5 (a) Write 5400 000 as a number in standard form.

(1 mark)

(b) Write 3.2×10^{-4} as an ordinary number.

(1 mark)

(c) The mass of the Sun is 2×10^{30} kg.
The mass of the largest known star is 315 times the mass of the Sun.

Work out the mass of this star.
Give your answer in kg in standard form.

(2 marks)

6 Simplify $8^2 \times \sqrt[3]{4^6}$

Give your answer in the form 2^a where a is an integer.

Show each stage of your working clearly.

(3 marks)

7 Work out, giving your answer in standard form,

$(7.1 \times 10^{-15}) \times (2 \times 10^3)$

(2 marks)