Powers, Roots & Standard Form

Question Paper

Course	Edexcel IGCSE Maths
Section	1. Numbers & the Number System
Topic	Powers, Roots & Standard Form
Difficulty	Hard

Time allowed: 60

Score: /46

Percentage: /100

Question 1a

Show that $2^{-3} = \frac{1}{8}$

[1 mark]

Question 1b

$5\sqrt{5}$ can be written in the form 5^k.

Find the value of k.

[1 mark]

Question 2a

Show that $81^{-\frac{1}{2}} = \frac{1}{9}$

[2 marks]

Question 2b

Show that $\left(\frac{64}{125}\right)^{\frac{2}{3}} = \frac{16}{25}$

[2 marks]

Question 3a

Write down the value of $64^{\frac{1}{2}}$.

[1 mark]

Question 3b

Show that $\left(\frac{8}{125}\right)^{-\frac{2}{3}} = \frac{25}{4}$

[2 marks]

Question 4a

Show that $\sqrt[3]{8 \times 10^6} = 200$

[1 mark]

Question 4b

Show that $144^{\frac{1}{2}} \times 64^{-\frac{1}{3}} = 3$

[2 marks]

Question 4c

Solve $3^{2x} = \frac{1}{81}$.

[2 marks]

Question 5a

Write $640\ 000\ 000$ in standard form.

[1 mark]

Question 5b

Work out $(3 \times 10^7) \div (6 \times 10^4)$
Give your answer in standard form.

[2 marks]

Question 6a

Write $5\ 400\ 000$ as a number in standard form.

[1 mark]

Question 6b

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

[1 mark]

Question 6c

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]

Question 7a

Write 7.97×10^{-6} as an ordinary number.

[1 mark]

Question 7b

Work out the value of $(2.52 \times 10^{5}) \div (4 \times 10^{-3})$
Give your answer in standard form.

[2 marks]

Question 8

$$p^2 = \frac{x - y}{xy}$$

$x = 8.5 \times 10^{9}$

$y = 4 \times 10^{8}$

Find the value of p.
Give your answer in standard form correct to 2 significant figures.

[3 marks]

Question 9a

$$T = \sqrt{\frac{w}{d^3}}$$

$w = 5.6 \times 10^{-5}$

$d = 1.4 \times 10^{-4}$

Work out the value of T.
Give your answer in standard form correct to 3 significant figures.

[2 marks]

Question 9b

w is increased by 10%
d is increased by 5%

Lottie says,

"The value of T will increase because both w and d are increased."

Lottie is wrong.
Explain why.

[2 marks]

Question 10a

Write 8.2×10^5 as an ordinary number.

[1 mark]

Question 10b

Write 0.000 376 in standard form.

[1 mark]

Question 10c

Work out the value of $(2.3 \times 10^{12}) \div (4.6 \times 10^{3})$
Give your answer in standard form.

[2 marks]

Question 11

Work out the value of $(3.5 \times 10^{6}) \div (5 \times 10^{-3})$.
Give your answer in standard form.

[2 marks]

Question 12

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]

Question 13

$a = 25 \times 10^{14n}$ where n is an integer.

Find an expression, in terms of n, for $a^{\frac{3}{2}}$

Give your answer in standard form.

[3 marks]

Question 14

Show that $\frac{\sqrt[3]{81}}{3}$ can be written as $3^{\frac{1}{3}}$

[3 marks]