

Q1.

Steph is solving a problem.

Cube A has a surface area of 150 cm^2

Cube B has sides half the length of cube A

What is the volume of cube B?

To solve this problem, Steph decides to

- halve the surface area
- calculate the square root of the answer
- then divide by 6
- then cube this answer to work out the volume.

Evaluate Steph's method.

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(Total 2 marks)

Q2.

Work out the value of $125^{-\frac{2}{3}}$

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Answer

(Total 3 marks)

Q3. Estimate the value of $101.4^{\frac{1}{2}} + 6.430 \times 7.99^{\frac{2}{3}}$

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Answer

(Total 4 marks)

Q4.

(a) Simplify $\sqrt{x^5 \times x^9}$

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Answer

(2)

(b) Solve $y^{-3} = 125$

$y = \dots\dots\dots$

(2)
(Total 4 marks)

Q5. Work out the value of $8^{-\frac{2}{3}}$

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Answer

(Total 2 marks)

Q6. $2m = 32$ and $9p = 3m$

Work out the values of m and p

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$m = \dots\dots\dots p = \dots\dots\dots$

(Total 4 marks)

Q7.

Express $\frac{1}{\sqrt[3]{x^2}}$ in the form x^a

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Answer

(Total 3 marks)

Q8. Find **two** sets of values for c and d such that

$$16c = 2d$$

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$c = \dots\dots\dots$ and $d = \dots\dots\dots$

or $c = \dots\dots\dots$ and $d = \dots\dots\dots$

(Total 3 marks)

Q9. Work out the value of $64^{\frac{2}{3}}$

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Answer

(Total 2 marks)

Q10.(a) Work out the value of $9^{-\frac{3}{2}}$

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Answer

(3)

(b) Work out **all** solutions of the equation

$$8^m = 2^{m^2}$$

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Answer

(3)
(Total 6 marks)

Q11. Work out the value of $27^{\frac{2}{3}}$

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Answer

(Total 2 marks)

Q12.(a) Show clearly that $4^{\frac{3}{2}} = 8$

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(2)

(b) Hence, or otherwise, work out the value of y if $4y = 86$

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Answer $y =$

(2)
(Total 4 marks)

Q13. Write these numbers in order of size starting with the smallest.

You **must** show your working.

$$27^{\frac{2}{3}}$$

$$64^{\frac{1}{3}}$$

$$4^{\frac{3}{2}}$$

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Answer,,

(Total 3 marks)

Q14.

A sphere has radius x centimetres.
 A hemisphere has radius y centimetres.
 The shapes have equal volumes.

Work out the value of $\frac{y}{x}$

Give your answer in the form $a^{\frac{1}{3}}$ where a is an integer.

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$$\frac{y}{x} = \dots\dots\dots$$

(Total 3 marks)

Q15. Put these in order starting with the smallest.
 You **must** show the value of each number in your working.

$$9^{\frac{1}{2}}$$

$$(-7)^0$$

$$\left(\frac{1}{8}\right)^{-\frac{1}{3}}$$

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Smallest.....

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Largest.....

(Total 4 marks)