Index laws, standard form and surds

Year 9 | Key Stage 3 | 16 questions, 48 marks

KS3 Maths topic practice

Scan for the solutions

Name: _____ **Date:** _____ **Score:** _____ **/ 48**

1 Write down the value of

a. $\sqrt{144}$

b. $\sqrt[3]{125}$

c. $\sqrt{0.49}$

d. $\sqrt[3]{-8}$

(4 marks)

Answer _____

2 Here are five numbers.

6 9 16 27 40

Write down the two numbers that are powers of 3

(1 mark)

Answer _____

3 a. Work out the value of

(i) 2^6 (ii) 3^4 (iii) 5^3

b. Write 64 as a power of 4.

c. Write 243 as a power of 3.

(3 marks)

Answer _____

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4 a. Write 10^5 as an ordinary number.

b. Write one million as a power of 10.

c. Write 10^{-2} as a decimal.

d. Write $10^3 \times 10^4$ as a single power of 10.

(4 marks)

Answer _____

5 Write down the value of 100^3

(1 mark)

Answer _____

6 Work out

a. $2^3 \times 3^2$

b. $5^2 + 4^3$

c. $(10^2 - 6^2) \div 2^3$

(3 marks)

Answer _____

7 a. Write 507,000 in standard form.

b. Write 2.6×10^{-3} as an ordinary number.

(2 marks)

Answer _____

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8 Ellie types $\sqrt{50}$ into her calculator. The calculator shows $5\sqrt{2}$

a. Explain what $5\sqrt{2}$ means.

b. Write $\sqrt{50}$ as a decimal. Give your answer correct to 2 decimal places.

c. Ellie types $\sqrt{12}$ and the calculator shows $2\sqrt{3}$. Write $\sqrt{12}$ as a decimal correct to 3 significant figures.

(3 marks)

Answer _____

9 a. Write $(5^3)^4$ as a single power of 5

b. Write down the value of 8^0

(2 marks)

Answer _____

10 a. Write 8^2 as a power of 2.

b. Write $4^3 \times 2^5$ as a single power of 2.

c. Write $9^4 \div 27$ as a single power of 3.

(4 marks)

Answer _____

11 Work out $(9 \times 10^8) \div (3 \times 10^{-2})$

Give your answer in standard form.

(2 marks)

Answer _____

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12 The mass of the Earth is 5.97×10^{24} kg.

The mass of the Moon is 7.35×10^{22} kg.

a. Work out how many times heavier the Earth is than the Moon. Give your answer to the nearest whole number.

b. Work out the total mass of the Earth and the Moon. Give your answer in standard form, correct to 3 significant figures.

(4 marks)

Answer _____

EXTENSION QUESTIONS

13 a. Here are five numbers.

$\sqrt{9}$ $\sqrt{10}$ $\sqrt{16}$ $\sqrt{20}$ $\sqrt[3]{8}$

Which of them are surds?

b. Hamza types $\sqrt{48}$ into his calculator. The display shows $4\sqrt{3}$. Show that $\sqrt{48} = 4\sqrt{3}$

c. Simplify $\sqrt{75}$

d. Work out $\sqrt{2} \times \sqrt{8}$

(4 marks)

Answer _____

14 Work out the value of

a. $49^{1/2}$

b. $64^{1/3}$

c. $16^{3/4}$

d. $27^{-2/3}$

(4 marks)

Answer _____

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15 Rationalise the denominator of $\frac{12}{\sqrt{3}}$

Give your answer in its simplest form.

(2 marks)

Answer _____

EXTENSION QUESTIONS

16 Rationalise the denominator of each of these. Give each answer in its simplest form.

a. $\frac{10}{\sqrt{5}}$

b. $\frac{3}{2\sqrt{6}}$

c. $\frac{\sqrt{3}+1}{\sqrt{3}}$

(5 marks)

Answer _____

End of questions | Total 48 marks

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