Test - Powers, roots and standard form

Year: Year 8 · Duration: 45 minutes · /20

Name:	Date:	**Mark: /20**

Question	1	2	3	4	5	Total
marks	4	4	4	4	4	**20**
Mark						

Show your working.

Question 1 (4 marks)

Question 1 – Indices and roots

Answer all parts. Show your working.

a. Work out $\sqrt{196}$ and $\sqrt[3]{125}$. (2 marks)

b. Write $\dfrac{3^8 \times 3^2}{3^4}$ as a single power of 3. (1 mark)

c. Work out 2^{-3}. (1 mark)

Question 2 (4 marks)

Question 2 – Prime factors

Use prime factors.

a. Write 90 as a product of prime factors. (2 marks)
b. Find the HCF of 90 and 84. (1 mark)
c. Find the LCM of 90 and 84. (1 mark)

Question 3 (4 marks)

Question 3 – Standard form

Work out each answer and give it in standard form.

a. Write 0.000 072 in standard form. (1 mark)
b. $(4 \times 10^5) \times (3 \times 10^4)$ (1 mark)
c. $(9 \times 10^8) \div (3 \times 10^{-2})$ (1 mark)
d. $6 \times 10^3 + 4 \times 10^2$ (1 mark)

Question 4 (4 marks)

Question 4 – Problem: the Earth and Mars

The Earth is 1.5×10^8 km from the Sun. Mars is 2.3×10^8 km from the Sun.

a. How much further from the Sun is Mars than Earth? Give your answer in standard form. (2 marks)
b. Light travels at 3×10^5 km/s. How long does light take to travel from the Sun to Mars? Give your answer in seconds to 3 s.f. (2 marks)

Question 5 (4 marks)

Question 5 – Problem: the bacteria

A culture starts with 500 bacteria. The number doubles every hour.

a. How many bacteria are there after 6 hours? Give your answer in standard form. (2 marks)
b. After how many hours does the culture first exceed 1 million? (2 marks)