Test - Indices and standard form

Year: Year 10 · 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 – Index laws

Non-calculator.

a. Simplify $(4x^3)^2 \times 3x$. (2 marks)

b. Work out the value of $\left(\frac{2}{5}\right)^{-2}$ and of $9^{\frac{1}{2}}$. (2 marks)

Question 2 (4 marks)

Question 2 – Standard form

Non-calculator.

a. Write $0.000\,086$ in standard form. (1 mark)

b. Work out $(3 \times 10^5) \times (4 \times 10^{-2})$. Give your answer in standard form. (2 marks)

c. Work out $(7.2 \times 10^6) \div (9 \times 10^2)$ in standard form. (1 mark)

Question 3 (4 marks)

Question 3 – Problem: the speed of sound

Calculator allowed. The speed of light is 3×10^8 m/s and the speed of sound in air is 3.4×10^2 m/s.

a. How many times faster is light than sound? Give your answer in standard form to 3 s.f. (2 marks)

b. Lightning strikes 5.1×10^3 m away. How many seconds after the flash is the thunder heard? (2 marks)

Question 4 (4 marks)

Question 4 – Estimating

Calculator allowed.

a. Estimate $\frac{58.7 \times 0.41}{0.19}$ by rounding each number to 1 significant figure. (2 marks)

b. Is your estimate bigger or smaller than the accurate answer? Explain. (2 marks)

Question 5 (4 marks)

Question 5 – Higher: indices

Higher tier.

a. Work out $64^{-\frac{2}{3}}$, giving your answer as a fraction. (2 marks)

b. Solve $2^{x+3} = \frac{1}{16}$. (2 marks)