FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

N9: Standard form

Solve problems involving standard form

20 marks · 25 minutes · Non-calculator

1) The Sun is 1.5×10^8 km from the Earth. Light travels at 3×10^5 km/s. How long does light take to reach the Earth? Give your answer in minutes and seconds.

.....

[Question 1: 3 marks]

2) The human body has about 3.7×10^{13} cells. Each is about 1×10^{-5} m wide. How long would a line of all the cells be? Give your answer in standard form.

..... m

[Question 2: 2 marks]

3) A country has 6.7×10^7 people. Each person uses 1.5×10^2 litres of water a day. How much water is used in total each day? Give your answer in standard form.

..... litres

[Question 3: 3 marks]

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4) $A = 4 \times 10^5$ and $B = 2.5 \times 10^{-3}$. Find $\frac{A}{B}$ in standard form.

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[Question 4: 2 marks]

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5) A hard drive holds 2×10^{12} bytes. Each photo uses 4×10^6 bytes. How many photos can it hold?

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[Question 5: 2 marks]

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6) An atom has a radius of 5×10^{-11} m. How many atoms placed side by side would stretch 1 mm?

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[Question 6: 3 marks]

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7) 3×10^{4} items each have a mass of 2.5×10^{-3} kg. Find their total mass.

..... kg

[Question 7: 2 marks]

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8) $(6 \times 10^n) \times (5 \times 10^3) = 3 \times 10^8$. Find n.

.....

[Question 8: 3 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	8 min 20 s	$1.5 \times 10^8 \div 3 \times 10^5$ (P1); 500 s (A1); 8 min 20 s (A1).
2	3.7×10^8	$3.7 \times 10^{13} \times 10^{-5}$ (P1); A1.
3	1.005×10^{10}	Multiply (P1); 10.05×10^9 (P1); A1.
4	1.6×10^8	$\frac{4}{2.5} \times 10^8$ (P1); A1.
5	5×10^5	Divide (P1); A1.
6	1×10^7	Diameter 1×10^{-10} m (P1); 1 mm = 10^{-3} m (P1); A1.
7	75	Multiply (P1); A1.
8	4	$30 \times 10^{n+3}$ (P1); $= 3 \times 10^{n+4}$ (P1); $n = 4$ (A1).