Year 9 Standard Form and Bounds – Developing

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Answers and worked solutions · 10 questions

A. Use standard form and bounds

1. **1.5×10^8**

Write both with 10^8: $3 \times 10^7 = 0.3 \times 10^8$

$= 1.5 \times 10^8$

2. **4.7×10^{-7}**

Write both with 10^{-7}: $5 \times 10^{-8} = 0.5 \times 10^{-7}$

$= 4.7 \times 10^{-7}$

3. **5.2×10^{-3}; 0.063; 2.8×10^{-1}; 4.8×10^{-1}**

Write them all in standard form and compare the powers of 10 first

Then compare the numbers in front

4. **6×10^{-2} g**

$3 \times 2 = 6$

$10^{-6} \times 10^4 = 10^{-2}$

$= 6 \times 10^{-2}$ g

5. **1.5×10^5 raindrops**

6 litres = 6000 ml

$6000 \div (4 \times 10^{-2})$

$= 1.5 \times 10^5$

6. **5×10^6 atoms**

1 mm = 1×10^{-3} m

$(1 \times 10^{-3}) \div (2 \times 10^{-10})$

$= 5 \times 10^6$

7. **40.5 kg**

Lower bound of one bag: 14 – 0.5 = 13.5 kg

$3 \times 13.5 = 40.5$ kg

8. **8550 people**

The lower bound is 8600 – 50 = 8550

8550 rounds up to 8600, so it is possible

9. **2.2×10^{-6}**

Put the decimal point after the first non-zero digit: 2.2

$0.0000022 = 2.2 \times 10^{-6}$

10. **The powers of 10 are the same, so just add the numbers: 9×10^5.**

Error: the indices were added, but this is an addition, not a multiplication

6 lots of 10^5 plus 3 lots of 10^5

$= 9 \times 10^5$