

10.7 Operations in Scientific Notation p. 450

(A) Addition and Subtraction

1) if they have the power of 10, add or subtract the factors and keep the same power; then make sure your answer is in scientific notation

$$(4.6 \times 10^3) + (8.72 \times 10^3) \\ 13.32 \times 10^{3+1} \rightarrow \boxed{1.332 \times 10^4}$$

$$(1.2 \times 10^{-2}) - (1.006 \times 10^{-2}) \\ 0.194 \times 10^{-2+1} \rightarrow \boxed{1.94 \times 10^{-3}}$$

2) if they have different powers of 10, first rewrite the numbers so that they have the same power of 10, then add or subtract and make sure your final answer is in s.n.

$$(3.5 \times 10^{-2}) - (6.6 \times 10^{-3+1}) \quad * \text{ you can rewrite either one} \\ (3.5 \times 10^{-2}) - 0.66 \times 10^{-2} \\ \boxed{2.84 \times 10^{-2}}$$

(B) Multiplication

- multiply the factors and add the exponents for the powers of 10
- final answer needs to be in s.n.

$$(3 \times 10^{-5}) \times (5 \times 10^{-2}) \\ 15 \times 10^{-7+1} \\ \boxed{1.5 \times 10^{-6}}$$

$$(2 \times 10^{-4}) \times (6 \times 10^{-3}) \\ 12 \times 10^{-7+1} \\ \boxed{1.2 \times 10^{-6}}$$

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- divide the factors and subtract the exponents for the powers of 10
- final answer needs to be in S.n.

$$\frac{1.5 \times 10^{-8}}{6 \times 10^7} = 0.25 \times 10^{-15-1} \rightarrow \boxed{2.5 \times 10^{-16}}$$

$$\frac{8.4 \times 10^3}{4.2 \times 10^{-2}} = \boxed{2 \times 10^5}$$

$$\frac{5.3 \times 10^8}{4 \times 10^{-3}} = \boxed{1.325 \times 10^{11}}$$