

F Lent Standard Form

Standard form is an efficient method of writing numbers that are very large and very small. It is *always* written as $A \times 10^n$ where $1 \leq A < 10$ and n is an integer. You must be able to carry out all four operations with numbers in standard form (+, -, \times , \div)

1. Convert the following to standard form.

- (a) 4600000000.
- (b) 322000000000.
- (c) 0.0000000433.

2. Convert the following to ordinary form.

- (a) 3.4×10^5 .
- (b) 2.91×10^{-5} .
- (c) 3.01×10^{-4} .

3. Evaluate the following, giving your answer in standard form.

- (a) $(3 \times 10^5) \times (2 \times 10^7)$.
- (b) $(2 \times 10^8) \times (8 \times 10^4)$.
- (c) $(4 \times 10^{10}) \times (4 \times 10^9)$.
- (d) $(8 \times 10^{50}) \times (9 \times 10^{12})$.
- (e) $(1 \times 10^{-5}) \times (2 \times 10^{-6})$.
- (f) $(4 \times 10^{-12}) \times (3 \times 10^5)$.
- (g) $(5 \times 10^{-5}) \times (6 \times 10^{17})$.
- (h) $\frac{4 \times 10^{12}}{2 \times 10^5}$.
- (i) $\frac{8 \times 10^6}{2 \times 10^{13}}$.
- (j) $\frac{2 \times 10^{14}}{4 \times 10^6}$.
- (k) $\frac{2 \times 10^{-6}}{8 \times 10^5}$.
- (l) $\frac{1 \times 10^{-10}}{8 \times 10^{-16}}$.
- (m) $\frac{2 \times 10^{12}}{5 \times 10^{-5}}$.

4. Evaluate the following, giving your answer in standard form.

- (a) $(3 \times 10^8) + (2 \times 10^7)$.
- (b) $(2.6 \times 10^7) + (4.1 \times 10^8)$.
- (c) $(4 \times 10^{-5}) + (3 \times 10^{-4})$.
- (d) $(5 \times 10^{800}) + (3 \times 10^{801})$.
- (e) $(9 \times 10^{356}) - (3 \times 10^{355})$.
- (f) $(2 \times 10^a) + (7 \times 10^{a+2})$.

5. Evaluate the following (with the given conditions), giving your answer in standard form.

- (a) If $a < \sqrt{10}$ and $b < \sqrt{10}$ find $(a \times 10^m) \times (b \times 10^n)$.
- (b) If $a > \sqrt{10}$ and $b > \sqrt{10}$ find $(a \times 10^m) \times (b \times 10^n)$.