

Physics 101 Math Review

1. Exponents and Scientific Notation:

(a) Find the following without the use of a calculator:

- $x^3 \cdot x^5$
- $10^7 \cdot 10^{-3}$
- $\frac{0.004 \times 32,000 \times 0.6}{6400 \times 3000 \times 0.08}$
- $(2.5 \times 10^{-6})(4 \times 10^6)$
- $\frac{(6 \times 10^6)(4 \times 10^{-5})^4}{(8 \times 10^2)^2(2 \times 10^{-4})^3}$

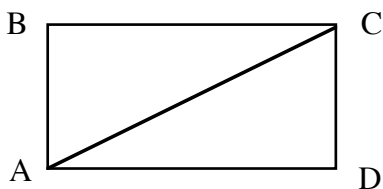
(b) Express the following as powers of 10 (i.e., scientific notation)

- 32,600
- 0.831
- 0.0002
- 1006
- 0.00000000019

2. Trigonometry:

(a) You are given a right triangle with one acute angle of 25° and the hypotenuse of length 10 cm. Find the other acute angle and the lengths of the other two sides.

(b) Figure ABCD below is a rectangle with the side AB 20.0 m long and angle $\text{DAC} = 39^\circ$. Find the lengths of diagonal AC and side AD.



3. Algebra: Given the following equations, solve for the indicated unknown.

- $5280 = 44t$: find t
- $3 = a/2 + a^2$: find a
- $v_f^2 = v_o^2 + (1/2)at^2$: find a if $v_f = 0$, $v_o = 20$, and $t = 4$
- $F = mv^2/r$: find r if $F = 455$, $m = 94$, and $v = 22$
- $\text{KE} = (1/2)mv^2$; find KE if $m = 9.1 \times 10^{-31}$ and $v = 3 \times 10^6$
- $T = (1/(2\pi)) (1.5/9.8)^{1/2}$: find T

4. Prefixes and numbers

(Be comfortable with everything from nano- up to giga: n, μ , m, k, M, G)

- Express 3.58 milligrams (mg) numerically in grams (g)
- Express 2.3 micrograms (μg) numerically in grams
- Express 15,700,000 newtons (N) numerically in meganewtons (MN)