AY4 Spring 2011: Cheat Sheet

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Contents

Metric Prefixes

Prefix	**Symbol**	**Value**
nano	n	10^{-9}
micro	μ	10^{-6}
milli	m	10^{-3}
centi	c	10^{-2}
deci	d	10^{-1}
deca	da	10^{1}
kilo	k	10^{3}
mega	M	10^{6}
giga	G	10^{9}
tera	T	10^{12}

Unit Conversions

Units		
inch/cm	1 inch = 2.54 cm	1 cm = 0.3937 cm
ft/m	1 ft = 0.305 m	1 m = 3.28 ft
mile/km	1 mile = 1.61 km	1 km = 0.62 miles
lb/g	1 lb = 453.6 g	1 g = 0.0022 lbs
lb/kg	1 lb = 0.453 kg	1 kg = 2.2 lbs
gal/liter	1 gal = 3.8 liters	1 liter = 0.27 gallons
calorie/erg	1 calorie = 4.2×10^{7} ergs	1 erg = 2.4×10^{-8} calories
AU (Astronomical Unit)/cm	1 AU = 1.5×10^{13} cm	
parsec (pc)/cm	1 pc = 3×10^{18} cm	
lightyear (ly)/cm	1 ly = 9.5×10^{17} cm	
solar mass ($M_\odot$/g	1 $M_\odot$ = 2×10^{33} g	
solar radius ($R_\odot$)/cm	1 $R_\odot$ = 7×10^{10} cm	
solar luminosity ($L_\odot$)/(erg/s)	1 $L_\odot$ = 4×10^{33} erg/s	
earth mass ($M_\oplus$)/g	1 $M_\oplus$ = 6×10^{27} g	
earth radius ($R_\oplus$)/cm	1 $R_\oplus$ = 6.4×10^{8} cm	

Physical Constants

Name	**Symbol**	**Value**	
Gravitational constant	G	6.67×10^{-8}	$cm^3g^{-1}s^{-2}$
Speed of light	c	3×10^{10}	cm/s
Planck's constant	h	6.6×10^{-27}	erg seconds
Mass of one hydrogen atom	m_H	1.7×10^{-24}	g
Mass of one electron	m_e	9.1×10^{-28}	g
Electron charge	e	4.8×10^{-10}	esu

Useful Formulae

- Kelvin (K) to Farenheit (F):

$$F = \frac{9}{5}(K - 273) + 32$$

- Farenheit (F) to Kelvin (K):

$$K = \frac{5}{9}(F - 32) + 273$$

- $$\text{Perimeter of a circle} = 2\pi r$$

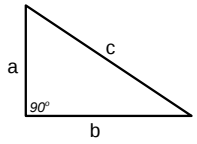
  where r is the circle's radius.

- $$\text{Area of a circle} = \pi r^2$$

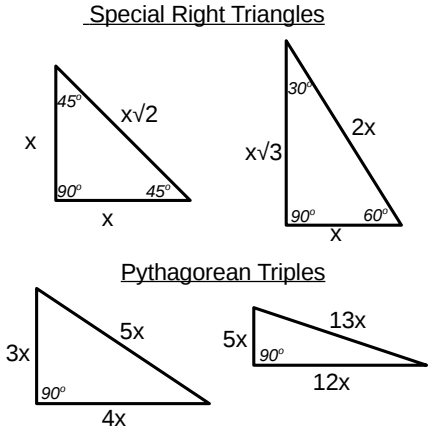
- $$\text{Surface area of a sphere} = 4\pi r^2$$

- $$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

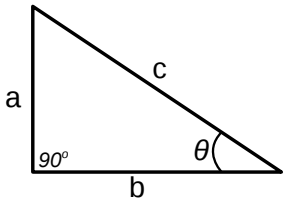
Trigonometry



The Pythagorean theorem states that $a^2 + b^2 = c^2$.



Four special (and useful!) families of right triangles.



Trigonometric formulae: $\sin\theta = \frac{a}{c}$, $\cos\theta = \frac{b}{c}$, $\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{a}{b}$