

Eq. ID	Formula	Symbols	SI Derived Unit		SI Unit		Properties		Distributions	
			Unit	Unit	Original	Ours	Original	Ours		
I.6.20	$f = \exp\left(-\frac{\theta^2}{2\sigma^2}\right) / \sqrt{2\pi\sigma^2}$	f	Probability density function	1	1	V, F	V, F	N/A	N/A	
		θ	Position	1	1	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$	
		σ	Standard deviation	1	1	V, F	V, F, P	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$	
I.6.20a	$f = \exp\left(-\frac{\theta^2}{2}\right) / \sqrt{2\pi}$	f	Probability density function	1	1	V, F	V, F	N/A	N/A	
		θ	Position	1	1	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$	
		σ	Standard deviation	1	1	V, F	V, F, P	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$	
I.6.20b	$f = \exp\left(-\frac{(\theta - \theta_0)^2}{2\sigma^2}\right) / \sqrt{2\pi\sigma}$	f	Probability density function	1	1	V, F	V, F	N/A	N/A	
		θ	Position	1	1	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$	
		θ_0	Position	1	1	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$	
I.9.18	$F = \frac{Gm_1m_2}{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$	F	Force of gravity	N	$kg \cdot m \cdot s^{-2}$	V, F	V, F	N/A	N/A	
		G	Gravitational constant	$m^3 \cdot kg^{-1} \cdot s^{-2}$	$kg^{-1} \cdot m^3 \cdot s^{-2}$	V, F	C, F, P	$U(1, 2)$	6.674×10^{-11}	
		m_1	Mass	kg	kg	V, F	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^3)$	
		m_2	Mass	kg	kg	V, F	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^3)$	
		x_2	Position	m	m	V, F	V, F	$U(1, 2)$	$U_{\log}(10^0, 10^1)$	
		x_1	Position	m	m	V, F	V, F	$U(3, 4)$	$U_{\log}(10^0, 10^1)$	
		y_2	Position	m	m	V, F	V, F	$U(1, 2)$	$U_{\log}(10^0, 10^1)$	
		y_1	Position	m	m	V, F	V, F	$U(3, 4)$	$U_{\log}(10^0, 10^1)$	
		z_2	Position	m	m	V, F	V, F	$U(1, 2)$	$U_{\log}(10^0, 10^1)$	
		z_1	Position	m	m	V, F	V, F	$U(3, 4)$	$U_{\log}(10^0, 10^1)$	
		t	Time	s	s	V, F	V, F	N/A	N/A	
		I.15.3t	$t_1 = \frac{t - ux/c^2}{\sqrt{1 - u^2/c^2}}$	t	Time	s	s	V, F	V, F, NN	$U(1, 5)$
u	Velocity			m/s	$m \cdot s^{-1}$	V, F	V, F	$U(1, 2)$	$U_{\log}(10^5, 10^7)$	
x	Position			m	m	V, F	V, F	$U(1, 5)$	$U_{\log}(10^0, 10^2)$	
c	Speed of light			m/s	$m \cdot s^{-1}$	V, F	C, F, P	$U(3, 10)$	2.998×10^8	
t_1	Time			s	s	V, F	V, F	N/A	N/A	
I.15.3x	$x_1 = \frac{x - ut}{\sqrt{1 - u^2/c^2}}$	x_1	Position	m	m	V, F	V, F	N/A	N/A	
		x	Position	m	m	V, F	V, F	$U(5, 10)$	$U_{\log}(10^0, 10^2)$	
		u	Velocity	m/s	$m \cdot s^{-1}$	V, F	V, F	$U(1, 2)$	$U_{\log}(10^0, 10^8)$	
		t	Time	s	s	V, F	V, F	$U(1, 2)$	$U_{\log}(10^{-6}, 10^{-4})$	
		c	Speed of light	m/s	$m \cdot s^{-1}$	V, F	C, F, P	$U(3, 20)$	2.998×10^8	
I.29.16	$x = \sqrt{x_1^2 + x_2^2 + 2x_1x_2 \cos(\theta_1 - \theta_2)}$	x	Wavelength	m	m	V, F	V, F, P	N/A	N/A	
		x_1	Wavelength	m	m	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^{-1}, 10^1)$	
		x_2	Wavelength	m	m	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^{-1}, 10^1)$	
		θ_1	Angle	rad	1	V, F	V, F, NN	$U(1, 5)$	$U(0, 2\pi)$	
		θ_2	Angle	rad	1	V, F	V, F, NN	$U(1, 5)$	$U(0, 2\pi)$	
I.30.3	$I = I_0 \frac{\sin^2(n\theta/2)}{\sin^2(\theta/2)}$	I	Amplitude of combined wave	1	1	V, F	V, F	N/A	N/A	
		I_0	Amplitude of wave	1	1	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^{-3}, 10^{-1})$	
		n	The number of waves	1	1	V, F	V, IP	$U(1, 5)$	$U_{\log}(10^1, 10^3)$	
		θ	Phase difference	rad	1	V, F	V, F	$U(1, 5)$	$U(-2\pi, 2\pi)$	
		c	Velocity	J	$kg \cdot m^2 \cdot s^{-2}$	V, F	V, F, P	N/A	N/A	
I.32.17	$P = \left(\frac{1}{2} \epsilon_0 E^2\right) \left(\frac{8\pi n^2}{3}\right) \left(\frac{\omega^4}{(\omega^2 - \omega_0^2)^2}\right)$	P	Vacuum permittivity	F/m	$kg^{-1} \cdot m^{-3} \cdot s^4 \cdot A^2$	V, F	C, F, P	$U(1, 2)$	8.854×10^{-12}	
		E	Speed of light	m/s	$m \cdot s^{-1}$	V, F	C, F, P	$U(1, 2)$	2.998×10^8	
		ϵ_0	Magnitude of electric field	m	m	V, F	V, F, P	$U(1, 2)$	$U_{\log}(10^4, 10^3)$	
		r	Radius	m	m	V, F	V, F, P	$U(1, 2)$	$U_{\log}(10^{-2}, 10^0)$	
		ω	Frequency of electromagnetic waves	rad/s	s^{-1}	V, F	V, F	$U(1, 2)$	$U_{\log}(10^9, 10^{11})$	
		ω_0	Frequency of electromagnetic waves	rad/s	s^{-1}	V, F	V, F	$U(3, 5)$	$U_{\log}(10^9, 10^{11})$	
		v	Frequency of electromagnetic waves	rad/s	s^{-1}	V, F	V, F	N/A	N/A	
		v	Velocity	m/s	$m \cdot s^{-1}$	V, F	V, F	$U(1, 2)$	$U_{\log}(10^6, 10^8)$	
		c	Speed of light	m/s	$m \cdot s^{-1}$	V, F	C, F, P	$U(3, 10)$	2.998×10^8	
		ω_0	Frequency of electromagnetic waves	rad/s	s^{-1}	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^9, 10^{11})$	
		I_{12}	Amplitude of wave	m	m	V, F	V, F, P	N/A	N/A	
		I.37.4	$I_{12} = I_1 + I_2 + 2\sqrt{I_1 I_2} \cos \delta$	I_1	Amplitude of wave	m	m	V, F	V, F, P	$U(1, 5)$
I_2	Amplitude of wave			m	m	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^{-1}, 10^{-3})$	
δ	Phase difference			rad	1	V, F	V, F	$U(1, 5)$	$U(0, \pi)$	
P	Pressure			Pa	$kg \cdot m^{-1} \cdot s^{-2}$	V, F	V, F, P	N/A	N/A	
n	Number of molecules			1	1	V, F	V, I*, P	$U(1, 5)$	$U_{\log}(10^{23}, 10^{25})$	
I.39.22	$P = \frac{nkT}{V}$	k	Boltzmann constant	J/K	$kg \cdot m^2 \cdot s^{-2} \cdot K^{-1}$	V, F	C, F, P	$U(1, 5)$	1.381×10^{-23}	
		T	Temperature	K	K	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^4, 10^3)$	
		V	Volume	m^3	m^3	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^{-5}, 10^{-3})$	
		n	Molecular density	$1/m^3$	m^{-3}	V, F	V, F, P	N/A	N/A	
		n_0	Molecular density	$1/m^3$	m^{-3}	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^{25}, 10^{27})$	
		m	Mass	kg	kg	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^{-24}, 10^{-22})$	
		g	Gravitational acceleration	m/s^2	$m \cdot s^{-2}$	V, F	C, F, P	$U(1, 5)$	9.807×10^0	
		h	Height	m	m	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^{-2}, 10^0)$	
		k	Boltzmann constant	J/K	$kg \cdot m^2 \cdot s^{-2} \cdot K^{-1}$	V, F	C, F, P	$U(1, 5)$	1.381×10^{-23}	
		T	Temperature	K	K	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^4, 10^3)$	
I.41.16	$L_{rad} = \frac{h}{2\pi} \frac{\omega^3}{\pi^2 c^2 (\exp(h\omega/2\pi kT) - 1)}$	L_{rad}	Radiation per frequency	J/m^2	$kg \cdot m^{-2} \cdot s^{-2}$	V, F	V, F, P	N/A	N/A	
		h	Planck constant	J · s	$kg \cdot m^2 \cdot s^{-1}$	V, F	C, F, P	$U(1, 5)$	6.626×10^{-34}	
		ω	Frequency of electromagnetic wave	rad/s	s^{-1}	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^{-1}, 10^1)$	
		c	Speed of light	m/s	$m \cdot s^{-1}$	V, F	C, F, P	$U(1, 5)$	2.998×10^8	
		k	Boltzmann constant	J/K	$kg \cdot m^2 \cdot s^{-2} \cdot K^{-1}$	V, F	C, F, P	$U(1, 5)$	1.381×10^{-23}	
		T	Temperature	K	K	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^1, 10^3)$	
		Q	Energy	J	$kg \cdot m^2 \cdot s^{-2}$	V, F	V, F	N/A	N/A	
		n	Number of molecules	1	1	V, F	V, I*, P	$U(1, 5)$	$U_{\log}(10^{23}, 10^{25})$	
		k	Boltzmann constant	J/K	$kg \cdot m^2 \cdot s^{-2} \cdot K^{-1}$	V, F	C, F, P	$U(1, 5)$	1.381×10^{-23}	
		T	Temperature	K	K	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^4, 10^3)$	
		V_1	Volume	m^3	m^3	V, F	V, F, P	$U(1, 5)$	$U_{\log}(10^{-5}, 10^{-3})$	
		I.50.26	$x = K(\cos \omega t + \epsilon \cos^2 \omega t)$	x	Amplitude	1	1	V, F	V, F	N/A
K	Amplitude			1	1	V, F	V, F, P	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$	
ω	Angular velocity			rad/s	s^{-1}	V, F	V, F	$U(1, 3)$	$U_{\log}(10^1, 10^3)$	
t	Time			s	s	V, F	V, NN	$U(1, 3)$	$U_{\log}(10^{-3}, 10^{-1})$	
ϵ	Variable			1	1	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-3}, 10^{-1})$	
II.6.15a	$E = \frac{p}{4\pi\epsilon} \frac{3z}{r^3} \sqrt{x^2 + y^2}$	E	Electric field	V/m	$kg \cdot m \cdot s^{-3} \cdot A^{-1}$	V, F	V, F	N/A	N/A	
		p	Electric dipole moment	C · m	$m \cdot s \cdot A$	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-22}, 10^{-20})$	
		ϵ	Vacuum permittivity	F/m	$kg^{-1} \cdot m^{-3} \cdot s^4 \cdot A^2$	V, F	C, F, P	$U(1, 3)$	8.854×10^{-12}	
		z	Position	m	m	V, F	V, F, P	$U(1, 3)$	$U_{\log}(10^{-10}, 10^{-8})$	
		r	Distance	m	m	V, F	V, F, P	$U(1, 3)$	$U_{\log}(10^{-10}, 10^{-8})$	
		x	Position	m	m	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-10}, 10^{-8})$	
		y	Position	m	m	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-10}, 10^{-8})$	
		E	Electric field	V/m	$kg \cdot m \cdot s^{-3} \cdot A^{-1}$	V, F	V, F	N/A	N/A	
		p	Electric dipole moment	C · m	$m \cdot s \cdot A$	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-22}, 10^{-20})$	
		ϵ	Vacuum permittivity	F/m	$kg^{-1} \cdot m^{-3} \cdot s^4 \cdot A^2$	V, F	C, F, P	$U(1, 3)$	8.854×10^{-12}	
II.6.15b	$E = \frac{p}{4\pi\epsilon} \frac{3 \cos \theta \sin \theta}{r^3}$	E	Electric field	V/m	$kg \cdot m \cdot s^{-3} \cdot A^{-1}$	V, F	V, F	N/A	N/A	
		p	Electric dipole moment	C · m	$m \cdot s \cdot A$	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-22}, 10^{-20})$	
		ϵ	Vacuum permittivity	F/m	$kg^{-1} \cdot m^{-3} \cdot s^4 \cdot A^2$	V, F	C, F, P	$U(1, 3)$	8.854×10^{-12}	
		θ	Angle	rad	1	V, F	V, F	$U(1, 3)$	$U(0, \pi)$	
		r	Distance	m	m	V, F	V, F, P	$U(1, 3)$	$U_{\log}(10^{-10}, 10^{-8})$	
		n	Number of polar molecules per angle per unit volume	$1/(m^3 \cdot rad \cdot sr)$	m^{-3}	V, F	V, F	N/A	N/A	
		n_0	Number of molecules per unit volume	$1/(m^3 \cdot sr)$	m^{-3}	V, F	V, F, P	$U(1, 3)$	$U_{\log}(10^{22}, 10^{20})$	
		p_0	Electric dipole moment	C · m	$m \cdot s \cdot A$	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-22}, 10^{-20})$	
		E	Magnitude of electric field	V/m	$kg \cdot m \cdot s^{-3} \cdot A^{-1}$	V, F	V, F, P	$U(1, 3)$	$U_{\log}(10^1, 10^3)$	
		θ	Angle	rad	1	V, F	V, NN	$U(1, 3)$	$U(0, 2\pi)$	
II.11.17	$n = n_0 \left(1 + \frac{p_0 E \cos \theta}{kT}\right)$	n	Number of polar molecules per angle per unit volume	$1/(m^3 \cdot rad \cdot sr)$	m^{-3}	V, F	V, F	N/A	N/A	
		n_0	Number of molecules per unit volume	$1/(m^3 \cdot sr)$	m^{-3}	V, F	V, F, P	$U(1, 3)$	$U_{\log}(10^{22}, 10^{20})$	
		p_0	Electric dipole moment	C · m	$m \cdot s \cdot A$	V, F	V, F	$U(1, 3)$	$U_{\log}(10^{-22}, 10^{-20})$	
		E	Magnitude of electric field	V/m	$kg \cdot m \cdot s^{-3} \cdot A^{-1}$	V, F	V, F, P	$U(1, 3)$	$U_{\log}(10^1, 10^3)$	
		θ	Angle	rad	1	V, F	V, NN	$U(1, 3)$	$U(0, 2\pi)$	
		k	Boltzmann constant	J/K	$kg \cdot m^2 \cdot s^{-2} \cdot K^{-1}$	V, F	C, F, P	$U(1, 3)$	1.381×10^{-23}	
		T	Temperature	K	K	V, F	V, F, P	$U(1, 3)$	$U_{\log}(10^1, 10^3)$	
		P	Polarizability	C/m^2	$m^{-2} \cdot s \cdot A$	V, F	V, F	N/A	N/A	
		n_0	Number of atoms	1	1	V, F	V, I*, P	$U(1, 5)$	$U_{\log}(10^{23}, 10^{25})$	
		p_0	Electric dipole moment	C · m	$m \cdot s \cdot A$	V, F	V, F	$U(1, 5)$	$U_{\log}(10^{-22}, 10^{-20})$	
II.11.20	$P = \frac{n_0 p_0^2 E}{3kT}$	P	Magnitude of electric field	V/m	$kg \cdot m \cdot s^{-3} \cdot A^{-1}$	V, F	V, F			