

Eq. ID	Formula	Symbols	SI Unit		Properties		Distributions		
			SI Unit	SI Unit	Original	Ours	Original	Ours	
1.6.20	$f = \exp\left(-\frac{\theta^2}{2\sigma^2}\right) / \sqrt{2\pi\sigma^2}$	$f$	Probability density function	1	1	V, F, P	V, F, P	N/A	N/A
		$\theta$	Position	1	1	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$
		$\sigma$	Standard deviation	1	1	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$
1.6.20a	$f = \exp\left(-\frac{\theta^2}{2\sigma^2}\right) / \sqrt{2\pi}$	$f$	Probability density function	1	1	V, F, P	V, F, P	N/A	N/A
		$\theta$	Position	1	1	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$
		$\sigma$	Standard deviation	1	1	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$
1.6.20b	$f = \exp\left(-\frac{(\theta - \theta_0)^2}{2\sigma^2}\right) / \sqrt{2\pi\sigma}$	$f$	Probability density function	1	1	V, F, P	V, F, P	N/A	N/A
		$\theta$	Position	1	1	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$
		$\sigma$	Standard deviation	1	1	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-1}, 10^1)$
1.9.18	$F = \frac{Gm_1m_2}{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$	$G$	Force of gravity	$m^3 \cdot kg^{-1} \cdot s^{-2}$	$kg \cdot m^{-3} \cdot s^{-2}$	V, F, P	V, F, P	N/A	N/A
		$m_1$	Gravitational constant	$m^3 \cdot kg^{-1} \cdot s^{-2}$	$kg^{-1} \cdot m^3 \cdot s^{-2}$	V, F, P	C, F, P	$U(1, 2)$	$6.674 \times 10^{-11}$
		$m_2$	Mass	kg	kg	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^3)$
		$x_2$	Position	m	m	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^1)$
		$y_2$	Position	m	m	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^1)$
		$z_2$	Position	m	m	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^1)$
		$x_1$	Position	m	m	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^1)$
		$y_1$	Position	m	m	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^1)$
		$z_1$	Position	m	m	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^1)$
		$t$	Time	s	s	V, F, P	V, F, P	N/A	N/A
1.15.3t	$t_1 = \frac{t - uv/c^2}{\sqrt{1 - u^2/c^2}}$	$t$	Time	s	s	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{-6}, 10^{-4})$
		$u$	Velocity	m/s	$m \cdot s^{-1}$	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^7)$
		$v$	Position	m	m	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^0, 10^2)$
		$c$	Speed of light	m/s	$m \cdot s^{-1}$	V, F, P	C, F, P	$U(3, 10)$	$2.998 \times 10^8$
		$x_1$	Position	m	m	V, F, P	V, F, P	N/A	N/A
		$x_2$	Position	m	m	V, F, P	V, F, P	$U(5, 10)$	$U_{\log}(10^0, 10^2)$
1.15.3x	$x_1 = \frac{x - vt}{\sqrt{1 - v^2/c^2}}$	$x_1$	Position	m	m	V, F, P	V, F, P	N/A	N/A
		$x_2$	Position	m	m	V, F, P	V, F, P	$U(5, 10)$	$U_{\log}(10^0, 10^2)$
		$u$	Velocity	m/s	$m \cdot s^{-1}$	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^8)$
		$t$	Time	s	s	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^{-6}, 10^{-4})$
		$c$	Speed of light	m/s	$m \cdot s^{-1}$	V, F, P	C, F, P	$U(3, 20)$	$2.998 \times 10^8$
		$x$	Wavelength	m	m	V, F, P	V, F, P	N/A	N/A
1.29.16	$x = \sqrt{x_1^2 + x_2^2 + 2x_1x_2 \cos(\theta_1 - \theta_2)}$	$x_1$	Wavelength	m	m	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{-1}, 10^1)$
		$x_2$	Wavelength	m	m	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{-1}, 10^1)$
		$\theta_1$	Angle	rad	1	V, F, P	V, F, NN	$U(1, 5)$	$U(0, 2\pi)$
		$\theta_2$	Angle	rad	1	V, F, P	V, F, NN	$U(1, 5)$	$U(0, 2\pi)$
		$I$	Amplitude of combined wave	1	1	V, F, P	V, F, P	N/A	N/A
1.30.3	$I = I_0 \frac{\sin^2(n\theta/2)}{\sin^2(\theta/2)}$	$I$	Amplitude of wave	1	1	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^1, 10^3)$
		$n$	Number of waves	1	1	V, F, P	V, I, P	$U(1, 5)$	$U_{\log}(10^1, 10^3)$
		$\theta$	Phase difference	rad	1	V, F, P	V, F, P	$U(1, 5)$	$U(-2\pi, 2\pi)$
		$\epsilon$	Energy	J	$kg \cdot m^2 \cdot s^{-2}$	V, F, P	V, F, P	N/A	N/A
		$\rho$	Vacuum permittivity	F/m	$kg^{-1} \cdot m^{-3} \cdot s^4 \cdot A^2$	V, F, P	C, F, P	$U(1, 2)$	$8.854 \times 10^{-12}$
1.32.17	$P = \left(\frac{1}{2} \epsilon_0 E^2\right) \left(\frac{2\pi r^2}{3}\right) \left(\frac{\omega^4}{(\omega^2 - \omega_0^2)^2}\right)$	$E$	Magnitude of electric field	m	m	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^1, 10^3)$
		$r$	Radius	m	m	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^{-2}, 10^0)$
		$\omega$	Frequency of electromagnetic waves	rad/s	$s^{-1}$	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^0, 10^{11})$
		$\omega_0$	Frequency of electromagnetic waves	rad/s	$s^{-1}$	V, F, P	V, F, P	$U(3, 5)$	$U_{\log}(10^0, 10^{11})$
		$\omega$	Frequency of electromagnetic waves	rad/s	$s^{-1}$	V, F, P	V, F, P	N/A	N/A
		$v$	Velocity	m/s	$m \cdot s^{-1}$	V, F, P	V, F, P	$U(1, 2)$	$U_{\log}(10^{-1}, 10^1)$
1.34.14	$\omega = \frac{1 + v^2/c^2}{\sqrt{1 - v^2/c^2}} \omega_0$	$\omega$	Frequency of electromagnetic waves	rad/s	$s^{-1}$	V, F, P	V, F, P	$U(1, 2)$	$2.998 \times 10^8$
		$v$	Velocity	m/s	$m \cdot s^{-1}$	V, F, P	V, F, P	$U(3, 10)$	$2.998 \times 10^8$
		$c$	Speed of light	m/s	$m \cdot s^{-1}$	V, F, P	C, F, P	$U(3, 10)$	$2.998 \times 10^8$
		$\omega_0$	Frequency of electromagnetic waves	rad/s	$s^{-1}$	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^0, 10^{11})$
		$I_{12}$	Amplitude of wave	m	m	V, F, NN	V, F, NN	N/A	N/A
1.37.4	$I_{12} = I_1 + I_2 + 2\sqrt{I_1 I_2} \cos \delta$	$I_1$	Amplitude of wave	m	m	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{-3}, 10^{-1})$
		$I_2$	Amplitude of wave	m	m	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{-3}, 10^{-1})$
		$\delta$	Phase difference	rad	1	V, F, P	V, F, NN	$U(1, 5)$	$U(0, 2\pi)$
		$P$	Pressure	Pa	$kg \cdot m^{-1} \cdot s^{-2}$	V, F, P	V, F, P	N/A	N/A
		$n$	Number of molecules	1	1	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{23}, 10^{25})$
1.39.22	$P = \frac{nkT}{V}$	$k$	Boltzmann constant	J/K	$kg \cdot m^2 \cdot s^{-2} \cdot K^{-1}$	V, F, P	C, F, P	$U(1, 5)$	$1.381 \times 10^{-23}$
		$T$	Temperature	K	K	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^0, 10^3)$
		$V$	Volume	$m^3$	$m^3$	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{-5}, 10^{-2})$
		$n$	Molecular density	$1/m^3$	$m^{-3}$	V, F, P	V, F, P	N/A	N/A
		$n_0$	Molecular density	$1/m^3$	$m^{-3}$	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{25}, 10^{27})$
		$m$	Mass	kg	kg	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{-24}, 10^{-22})$
1.40.1	$n = n_0 \exp(-mgx/kT)$	$g$	Gravitational acceleration	m/s <sup>2</sup>	$m \cdot s^{-2}$	V, F, P	C, F, P	$U(1, 5)$	$9.807 \times 10^0$
		$x$	Height	m	m	V, F, P	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, P	C, F, P	$U(1, 5)$	$1.381 \times 10^{-23}$
		$T$	Temperature	K	K	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^1, 10^3)$
		$I_{rad}$	Radiation per frequency	J/m <sup>2</sup>	$kg \cdot s^{-2}$	V, F, P	V, F, P	N/A	N/A
		$\hbar$	Planck constant	J · s	$kg \cdot m^2 \cdot s^{-1}$	V, F, P	C, F, P	$U(1, 5)$	$6.626 \times 10^{-34}$
1.41.16	$L_{rad} = \frac{\hbar}{2\pi} \frac{\omega^3}{\pi^2 c^2 (\exp(\hbar\omega/2\pi kT) - 1)}$	$\omega$	Frequency of electromagnetic wave	1/s	$s^{-1}$	V, F, P	C, F, P	$U(1, 5)$	$U_{\log}(10^{-1}, 10^1)$
		$c$	Speed of light	m/s	$m \cdot s^{-1}$	V, F, P	C, F, P	$U(1, 5)$	$2.998 \times 10^8$
		$k$	Boltzmann constant	J/K	$kg \cdot m^2 \cdot s^{-2} \cdot K^{-1}$	V, F, P	C, F, P	$U(1, 5)$	$1.381 \times 10^{-23}$
		$T$	Temperature	K	K	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^1, 10^3)$
		$Q$	Energy	J	$kg \cdot m^2 \cdot s^{-2}$	V, F, P	V, F, P	N/A	N/A
		$n$	Number of molecules	1	1	V, F, P	V, I, P	$U(1, 5)$	$U_{\log}(10^{24}, 10^{26})$
1.44.4	$Q = nkT \ln\left(\frac{V_2}{V_1}\right)$	$k$	Boltzmann constant	J/K	$kg \cdot m^2 \cdot s^{-2} \cdot K^{-1}$	V, F, P	C, F, P	$U(1, 5)$	$1.381 \times 10^{-23}$
		$T$	Temperature	K	K	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^1, 10^3)$
		$V_2$	Volume	$m^3$	$m^3$	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{-5}, 10^{-3})$
		$V_1$	Volume	$m^3$	$m^3$	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{-5}, 10^{-2})$
		$x$	Amplitude	1	1	V, F, P	V, F, P	N/A	N/A
		$K$	Amplitude	1	1	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^0, 10^1)$
1.50.26	$x = K(\cos \omega t + e \cos \omega t)$	$\omega$	Angular velocity	rad/s	$s^{-1}$	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^0, 10^3)$
		$t$	Time	s	s	V, F, P	V, F, NN	$U(1, 3)$	$U_{\log}(10^{-3}, 10^{-1})$
		$\epsilon$	Variable	1	1	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-3}, 10^{-1})$
		$E$	Electric field	V/m	$kg \cdot m \cdot s^{-3} \cdot A^{-1}$	V, F, P	V, F, P	N/A	N/A
		$p$	Electric dipole moment	C · m	$m \cdot s \cdot A$	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-22}, 10^{-20})$
		$\epsilon$	Vacuum permittivity	F/m	$kg^{-1} \cdot m^{-3} \cdot s^4 \cdot A^2$	V, F, P	C, F, P	$U(1, 3)$	$8.854 \times 10^{-12}$
II.6.15a	$E = \frac{p}{4\pi\epsilon_0 r^2} \sqrt{x^2 + y^2}$	$\epsilon$	Vacuum permittivity	F/m	$kg^{-1} \cdot m^{-3} \cdot s^4 \cdot A^2$	V, F, P	C, F, P	$U(1, 3)$	$8.854 \times 10^{-12}$
		$r$	Position	m	m	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-10}, 10^{-8})$
		$x$	Distance	m	m	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-10}, 10^{-8})$
		$y$	Position	m	m	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-10}, 10^{-8})$
		$E$	Electric field	V/m	$kg \cdot m \cdot s^{-3} \cdot A^{-1}$	V, F, P	V, F, P	N/A	N/A
		$p$	Electric dipole moment	C · m	$m \cdot s \cdot A$	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-22}, 10^{-20})$
II.6.15b	$E = \frac{p}{4\pi\epsilon_0} \frac{3 \cos \theta \sin \theta}{r^3}$	$\epsilon$	Vacuum permittivity	F/m	$kg^{-1} \cdot m^{-3} \cdot s^4 \cdot A^2$	V, F, P	C, F, P	$U(1, 3)$	$8.854 \times 10^{-12}$
		$\theta$	Angle	rad	1	V, F, P	V, F, P	$U(1, 3)$	$U(0, \pi)$
		$r$	Distance	m	m	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-10}, 10^{-8})$
		$n$	Number of polar molecules per angle per unit volume	$1/(m^3 \cdot sr)$	$m^{-3}$	V, F, P	V, F, P	N/A	N/A
		$n_0$	Number of molecules per unit volume	$1/(m^3 \cdot sr)$	$m^{-3}$	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{27}, 10^{29})$
		$n_0$	Electric dipole moment	C · m	$m \cdot s \cdot A$	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^{-22}, 10^{-20})$
II.11.17	$n = n_0 \left(1 + \frac{p_0 E \cos \theta}{kT}\right)$	$E$	Magnitude of electric field	V/m	$kg \cdot m \cdot s^{-3} \cdot A^{-1}$	V, F, P	V, F, P	$U(1, 3)$	$U_{\log}(10^1, 10^3)$
		$\theta$	Angle	rad	1	V, F, P	V, F, 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, P	C, F, P	$U(1, 3)$	$1.381 \times 10^{-23}$
		$T$	Temperature	K	K	V, F, P	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, P	V, F, P	N/A	N/A
		$n$	Number of atoms	1	1	V, F, P	V, I, P	$U(1, 5)$	$U_{\log}(10^{23}, 10^{25})$
II.11.20	$P = \frac{n_0 p_0^2 E}{3kT}$	$p_0$	Electric dipole moment	C · m	$m \cdot s \cdot A$	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^{-22}, 10^{-20})$
		$E$	Magnitude of electric field	V/m	$kg \cdot m \cdot s^{-3} \cdot A^{-1}$	V, F, P	V, F, P	$U(1, 5)$	$U_{\log}(10^1, 10^3)$
		$k$	Boltzmann constant	J/K	$kg \cdot m^2 \cdot s^{-2} \cdot K^{-1}$	V, F, P	C, F, P	$U(1, 5)$	$1.381 \times 10^{-23}$
		$T$							