Appendix M
Table of Built-In Equations

The Equation Library consists of 15 subjects corresponding to the sections in the table below) and more than 100 titles. The numbers in parentheses below indicate the number of equations in the set and the number of variables in the set. There are 315 equations in total using 396 variable.

Subjects and Titles

1: Columns and Beams (14, 20)	
1: Elastic Buckling (4, 8)	6: Simple Sheer (1, 7)
2: Eccentric Columns (2, 11)	7: Cantilever Deflection (1, 10)
3: Simple Deflection (1, 9)	8: Cantilever Slope (1, 10)
4: Simple Slope (1, 10)	9: Cantilever Moment (1, 8)
5: Simple Moment (1, 8)	10: Cantilever Shear (1, 6)
2: Electricity (42, 56)	
1: Coulomb's Law (1, 5)	13: Capacitor Charge (1, 3)
2: Ohm's Law and Power (4, 4)	14: DC Inductor Voltage (3, 8)
3: Voltage Divider (1, 4)	15: RC transient (1, 6)
4: Current Divider (1, 4)	16: RL transient (1, 6)
5: Wire Resistance (1, 4)	17: Resonant Frequency (4, 7)
6: Series and Parallel R (2, 4)	18: Plate Capacitor (1, 4)
7: Series and Parallel C (2, 4)	19: Cylindrical Capacitor (1, 5)
8: Series and Parallel L (2, 4)	20: Solenoid Inductance (1, 5)
9: Capacitance Energy (1, 3)	21: Toroid Inductance (1, 6)
10: Inductive Energy (1, 3)	22: Sinusoidal Voltage (2, 6)
11: RLC Current Delay (5, 9)	23: Sinusoidal Current (2, 6)
12: DC Capacitor Current (3, 8)	

3: Fluids (29, 29)

1: Pressure at Depth (1, 4)
2: Bernoulli Equation (10, 15)
3: Flow with Losses (10, 17)
4: Flow in Full Pipes (8, 19)

4: Forces and Energy (31, 36)

1: Linear Mechanics (8, 11)
2: Angular Mechanics (12, 15)
3: Centripetal Force (4, 7)
4: Hooke's Law (2, 4)
5: ID Elastic Collisions (2, 5)
6: Drag Force (1, 5)
7: Law of Gravitation (1, 4)
8: Mass–Energy Relation (4, 9)

5: Gases (18, 26)

1: Ideal Gas Law (2, 6)
2: Ideal Gas State Change (1, 6)
3: Isothermal Expansion (2, 7)
4: Polytropic Processes (2, 7)
5: Isentropic Flow (4, 10)
6: Real Gas Law (2, 8)
7: Real Gas State Change (1, 8)
8: Kinetic Theory (4, 9)

6: Heat Transfer (17, 31)

1: Heat Capacity (2, 6)
2: Thermal Expansion (2, 6)
3: Conduction (2, 7)
4: Convection (2, 6)
5: Conduction and Convection (4, 14))
6: Black Body Radiation (5, 9)

7: Magnetism (4, 14)

1: Straight Wire (1,5)
2: Force Between Wires (1, 6)
3: B Field in Solenoid (1, 4)
4: Field in Toroid (1, 6)

8: Motion (22, 24)

1: Linear Motion (4, 6)
2: Object in Free Fall (4, 5)
3: Projectile Motion (5, 10)
4: Angular Motion (4, 6)
5: Circular Motion (3, 5)
6: Terminal Velocity (1, 5)
7: Escape Velocity (1, 14)

9: Optics (11, 14)	
1: Law of Refraction (1, 4)	4: Spherical Reflection (3, 5)
2: Critical Angle (1, 3)	5: Spherical Refraction (1, 5)
3: Brewster's Law (2, 4)	6: Thin Lens (3, 7)
10: Oscillations (17, 17)	
1: Mass–Spring System (1, 4)	4: Torsional Pendulum (3, 7)
2: Simple Pendulum (3, 4)	5: Simple Harmonic (4, 8)
3: Conical Pendulum (4, 6)	
11: Plane Geometry (31, 21)	
1: Circle (5, 7)	4: Regular Polygon (6, 8)
2: Ellipse (5, 8)	5: Circular Ring (4,7)
3: Rectangle (5, 8)	6: Triangle (6, 107)
12: Solid Geometry (18, 12)	
1: Cone (5, 9)	3: Parallelepiped (4, 9)
2: Cylinder (5, 9)	4: Sphere (4, 7)
13: Solid State Devices (33, 53)	
1: PN Step Junctions (8, 19)	3: Bipolar Transistors (8, 14)
2: NMOS Transistors (10, 23)	4: JFETs (7, 15)
14: Stress Analysis (16, 28)	
1: Normal Stress (3, 7)	3: Stress on an Element (3, 7)
2: Shear Stress (3, 8)	4: Mohr's Circle (7, 10)
15: Waves (12, 15)	
1: transverse Waves (4, 9)	3: Sound Waves (4,8)
2: Longitudinal Waves (4, 9)	