**Important Sections of Human Life & Business (with Formula Focus)**

**1. Personal Finance & Money Management**

**2. Health & Fitness**

**3. Education & Learning**

**4. Business & Entrepreneurship**

**5. Work & Productivity**

**6. Science & Technology**

**7. Construction & Engineering**

**8. Travel & Transportation**

**9. Household & Lifestyle**

**10. Real Estate & Property**

**11. Agriculture & Farming**

**12. Environment & Climate**

**13. Sports & Recreation**

**14. Human Relationships & Social Life**

**📊 100 Formulas in Personal Finance & Money Management**

**1. Savings & Budgeting (10 formulas)**

1. Monthly Savings = Income − Expenses
2. Emergency Fund = 6 × Monthly Expenses
3. 50/30/20 Rule = (50% Needs, 30% Wants, 20% Savings)
4. Future Value of Savings = Present Value × (1 + r)^t
5. Required Monthly Savings = Target Amount ÷ Months Left
6. Time to Reach Goal = ln(FV ÷ PV) ÷ ln(1 + r)
7. Inflation Adjusted Savings = Nominal Savings ÷ (1 + Inflation Rate)^t
8. Real Value of Money = Nominal Value ÷ CPI
9. Savings Rate % = (Savings ÷ Income) × 100
10. Net Worth = Assets − Liabilities

**2. Loan & Debt Management (15 formulas)**

1. Loan EMI = [P × r × (1+r)^n] ÷ [(1+r)^n − 1]
2. Loan Interest = Principal × Rate × Time
3. Outstanding Loan Balance = EMI × n\_remaining
4. Debt-to-Income Ratio = (Monthly Debt Payments ÷ Monthly Income) × 100
5. Loan-to-Value Ratio (LTV) = Loan Amount ÷ Asset Value × 100
6. Effective Interest Rate = (1 + (i/n))^n − 1
7. APR = [(Total Interest + Fees) ÷ Loan Amount ÷ Years] × 100
8. Simple Loan Payoff Time = Debt ÷ Monthly Payment
9. Amortization (nth payment interest) = Remaining Principal × Rate ÷ 12
10. Credit Card Interest = Balance × (APR ÷ 12)
11. Snowball Payoff Order = Smallest Debt → Largest
12. Avalanche Payoff Order = Highest Interest → Lowest
13. Debt Coverage Ratio = Net Income ÷ Total Debt Payment
14. Balloon Payment = Loan Principal − (EMI × Paid Installments)
15. Mortgage Affordability = 28% × Gross Monthly Income

**3. Investment (Stock, Bonds, Mutual Funds) (15 formulas)**

1. ROI = (Final Value − Initial Value) ÷ Initial Value × 100
2. CAGR = [(FV ÷ PV)^(1/t) − 1] × 100
3. Dividend Yield = Annual Dividend ÷ Share Price × 100
4. EPS = Net Income ÷ Outstanding Shares
5. P/E Ratio = Share Price ÷ EPS
6. Market Capitalization = Share Price × Shares Outstanding
7. Price-to-Book Ratio = Share Price ÷ (Assets − Liabilities per Share)
8. Sharpe Ratio = (Portfolio Return − Risk-Free Rate) ÷ Std Dev
9. Bond Yield = Annual Coupon ÷ Bond Price × 100
10. Yield to Maturity (YTM) ≈ [C + (F − P)/n] ÷ [(F+P)/2]
11. Net Asset Value (NAV) = (Assets − Liabilities) ÷ Units
12. Alpha = Portfolio Return − Benchmark Return
13. Beta = Covariance(Ra,Rm) ÷ Variance(Rm)
14. Annualized Return = (1+Return)^(1/t) − 1
15. Rule of 72 = 72 ÷ Interest Rate

**4. Retirement Planning (10 formulas)**

1. Retirement Corpus = Annual Expense × Retirement Years × (1+Inflation)^t
2. Safe Withdrawal Rate = 4% × Retirement Corpus
3. Future Value of Annuity = P × [(1+r)^n − 1] ÷ r
4. Present Value of Annuity = P × [1 − (1+r)^−n] ÷ r
5. Pension Value = Annual Pension ÷ Discount Rate
6. Required Retirement Savings = (Annual Expenses − Pension) × Years
7. Inflation Adjusted Corpus = Corpus ÷ (1+Inflation)^t
8. Social Security Replacement Rate ≈ 40% × Final Salary
9. Annuity Payout = PV ÷ Annuity Factor
10. Longevity Risk Buffer = 25% Extra Savings

**5. Insurance & Risk (10 formulas)**

1. Insurance Coverage Ratio = Insurance ÷ Annual Income
2. Human Life Value (HLV) = Annual Income × Years Left till Retirement
3. Premium = Coverage × Risk Factor × Term ÷ 1000
4. Sum Assured = Annual Expenses × Years Remaining
5. Loss Ratio = Claims Paid ÷ Premiums Collected
6. Risk Probability = Event Frequency ÷ Total Events
7. Expected Loss = Probability × Loss Amount
8. Replacement Cost = Asset Value − Depreciation
9. Premium-to-Income Ratio = Annual Premium ÷ Annual Income × 100
10. Insurance Adequacy = Coverage ÷ Liabilities × 100

**6. Taxation (10 formulas)**

1. Taxable Income = Gross Income − Deductions
2. Effective Tax Rate = Tax Paid ÷ Total Income × 100
3. Average Tax Rate = Total Tax ÷ Taxable Income × 100
4. Marginal Tax Rate = Tax Rate on Last Income Slab
5. Capital Gains = Sale Price − Purchase Price − Expenses
6. After-Tax Return = Return × (1 − Tax Rate)
7. Tax Savings from Deduction = Deduction × Tax Rate
8. GST/VAT = Price × Tax %
9. Net Income After Tax = Gross Income − Taxes
10. Dividend Tax = Dividend × Tax Rate

**7. Real Estate & Property (10 formulas)**

1. Rental Yield = (Annual Rent ÷ Property Value) × 100
2. Gross Rent Multiplier = Property Value ÷ Annual Rent
3. Cap Rate = Net Operating Income ÷ Property Value × 100
4. Loan-to-Cost Ratio = Loan Amount ÷ Project Cost × 100
5. Net Operating Income = Rent − Operating Expenses
6. Break-even Occupancy = Expenses ÷ Gross Income × 100
7. Payback Period = Cost ÷ Annual Cash Inflow
8. Cash-on-Cash Return = Annual Cash Flow ÷ Invested Cash × 100
9. Property Tax = Property Value × Tax Rate
10. Appreciation = (Current Value − Purchase Value) ÷ Purchase Value × 100

**8. Currency, Inflation & Economics (10 formulas)**

1. Real Interest Rate = Nominal Rate − Inflation Rate
2. Purchasing Power Parity = Exchange Rate × (Price Index A ÷ Price Index B)
3. Big Mac Index = Price in Country A ÷ Price in Country B
4. Effective Exchange Rate = Weighted Avg of Currency Rates
5. Inflation Rate = [(CPI\_t − CPI\_t-1) ÷ CPI\_t-1] × 100
6. GDP Deflator = (Nominal GDP ÷ Real GDP) × 100
7. Real Wage = Nominal Wage ÷ (1+Inflation)^t
8. Disposable Income = Income − Taxes − Fixed Obligations
9. Savings to GDP Ratio = Savings ÷ GDP × 100
10. Money Velocity = GDP ÷ Money Supply

**9. Wealth & Asset Management (10 formulas)**

1. Net Worth = Assets − Liabilities
2. Asset Allocation % = (Asset ÷ Portfolio Value) × 100
3. Weighted Portfolio Return = Σ(Weight × Return)
4. Rebalancing % = (Current Weight − Target Weight) ÷ Target Weight × 100
5. Diversification Ratio = Portfolio Std Dev ÷ Weighted Avg Std Dev
6. Wealth Growth Rate = (End Net Worth − Start Net Worth) ÷ Years
7. Liquid Net Worth = Liquid Assets − Short-Term Liabilities
8. Debt-to-Asset Ratio = Total Debt ÷ Total Assets × 100
9. Financial Independence Number = Annual Expense ÷ Withdrawal Rate
10. Wealth Index = Net Worth ÷ (Annual Expense × Years)

**🏋️‍♂️ 100 Formulas in Health & Fitness**

**1. Body Metrics (15 formulas)**

1. **BMI (Body Mass Index)** = Weight (kg) ÷ Height² (m²)
2. **BMR (Mifflin-St Jeor)** = 10×W + 6.25×H − 5×Age + (s)  
   (s = +5 men, −161 women)
3. **BMR (Harris-Benedict)** = 66 + (13.7×W) + (5×H) − (6.8×Age) (men)
4. **Ideal Body Weight (Devine)** = 50 + 2.3×(height in inches−60)
5. **Body Fat % (Navy)** = 86.010×log10(waist−neck) − 70.041×log10(height) + 36.76 (men)
6. **Body Fat % (US Army)** = (495 ÷ Body Density) − 450
7. **Waist-to-Hip Ratio** = Waist ÷ Hip
8. **Waist-to-Height Ratio** = Waist ÷ Height
9. **Lean Body Mass** = Body Weight − (Body Weight × Body Fat %)
10. **FFMI (Fat-Free Mass Index)** = LBM ÷ Height²
11. **Calorie Maintenance (TDEE)** = BMR × Activity Factor
12. **VO2 Max (Cooper Test)** = (Distance in meters − 504.9) ÷ 44.73
13. **VO2 Max (Step Test)** = 111.33 − (0.42 × HR)
14. **Basal Water Requirement** = 30 ml × Body Weight (kg)
15. **Surface Area (DuBois)** = 0.007184 × W^0.425 × H^0.725

**2. Nutrition & Diet (15 formulas)**

1. **Calorie Needs** = Protein Cal + Carb Cal + Fat Cal
2. **Protein Requirement** = 1.2–2.0 × Body Weight (kg)
3. **Fat Requirement** = 0.8–1.0 × Body Weight (kg)
4. **Carb Requirement** = (Total Calories − Protein − Fat) ÷ 4
5. **Glycemic Load** = (GI × Carbs (g)) ÷ 100
6. **Daily Fiber** = 14 g ÷ 1000 kcal consumed
7. **Hydration Index** = Water Intake ÷ Requirement × 100
8. **Electrolyte Balance (Na/K)** = Sodium ÷ Potassium
9. **Caloric Deficit/Surplus** = Intake − TDEE
10. **Macronutrient % Split** = (Macro Cal ÷ Total Cal) × 100
11. **Sugar Load** = (Grams of Sugar ÷ Total Carbs) × 100
12. **Alcohol Calories** = Volume (ml) × %Alcohol × 7.1 ÷ 100
13. **Meal Frequency Energy** = Total Calories ÷ Meals per Day
14. **Protein Digestibility** = (Absorbed Protein ÷ Intake) × 100
15. **Satiety Index** = Fullness Rating ÷ Calories

**3. Exercise & Training (20 formulas)**

1. **Max HR** = 220 − Age
2. **Target HR (Moderate)** = Max HR × 0.5–0.7
3. **Target HR (Vigorous)** = Max HR × 0.7–0.85
4. **Karvonen HR** = [(HRmax − HRrest) × %Intensity] + HRrest
5. **Calorie Burn (Running)** = Distance × Weight × 1.036
6. **Calorie Burn (Walking)** = Distance × Weight × 0.57
7. **METs (Exercise)** = (O₂ consumed ÷ 3.5)
8. **Calories Burned** = MET × Weight × Duration ÷ 60
9. **Strength Progression** = New Max = Old Max × (1 + %Increase)
10. **One Rep Max (Epley)** = W × (1 + Reps ÷ 30)
11. **One Rep Max (Brzycki)** = W ÷ (1.0278 − 0.0278×Reps)
12. **Volume Load (Weights)** = Weight × Reps × Sets
13. **Training Density** = Total Work ÷ Time
14. **Work (Physics)** = Force × Distance
15. **Power Output** = Work ÷ Time
16. **Pace (Running)** = Time ÷ Distance
17. **Speed** = Distance ÷ Time
18. **Cadence (Running)** = Steps ÷ Minutes
19. **Training Intensity %** = (Lift ÷ 1RM) × 100
20. **Recovery Ratio** = Work Interval ÷ Rest Interval

**4. Medical & Clinical (15 formulas)**

1. **BMI-for-age z-score** = (BMI−Median) ÷ SD
2. **Blood Pressure Mean (MAP)** = (SBP + 2×DBP) ÷ 3
3. **Pulse Pressure** = SBP − DBP
4. **Cardiac Output** = HR × Stroke Volume
5. **Stroke Volume** = EDV − ESV
6. **Ejection Fraction %** = (SV ÷ EDV) × 100
7. **Respiratory Rate** = Breaths ÷ Minute
8. **Minute Ventilation** = Tidal Volume × Respiratory Rate
9. **Oxygen Saturation %** = (O₂ Hb ÷ Total Hb) × 100
10. **Glomerular Filtration Rate (eGFR)** = k × (Creatinine⁻¹) × Age
11. **Blood Sugar Index** = Glucose ÷ Normal Range × 100
12. **HbA1c (Avg Glucose)** = (28.7 × HbA1c) − 46.7
13. **Body Temp Adjusted HR** = HR + (1 bpm per 1°C rise)
14. **Insulin Sensitivity Index** = 10,000 ÷ √(Glucose × Insulin × Product)
15. **Creatinine Clearance** = (140 − Age) × Weight ÷ (72 × Serum Creatinine)

**5. Sports Performance (15 formulas)**

1. **Batting Average (Cricket/Baseball)** = Runs ÷ Outs
2. **Bowling Economy** = Runs ÷ Overs
3. **Basketball FG%** = (FG Made ÷ FG Attempted) × 100
4. **Basketball EFG%** = (FGM + 0.5×3PM) ÷ FGA
5. **Football Passing Accuracy** = Completions ÷ Attempts × 100
6. **Tennis First Serve %** = First Serves In ÷ First Serves Attempted
7. **VO2 Score (Yo-Yo Test)** = Distance ÷ Time
8. **Pace per 100m (Swimming)** = Time ÷ Laps
9. **Golf Handicap** = (Score − Course Rating) × 113 ÷ Slope Rating
10. **Cycling FTP (Functional Threshold Power)** = Avg Power ÷ 60
11. **Stride Length** = Distance ÷ Strides
12. **Agility Index** = (Time ÷ Benchmark Time) × 100
13. **Sprint Speed** = Distance ÷ Sprint Time
14. **Lactate Threshold %HRmax** = HR at LT ÷ HRmax × 100
15. **Wingate Anaerobic Power** = (Force × Distance ÷ Time)

**6. Health Risk Assessment (10 formulas)**

1. **Obesity Index** = BMI ÷ Normal BMI × 100
2. **Cholesterol Ratio** = Total Cholesterol ÷ HDL
3. **Atherogenic Index** = log10(TG ÷ HDL)
4. **Cardio Risk Score** = (LDL + TG + BP + BMI) ÷ Age
5. **Framingham Risk %** = Age + Cholesterol + BP + Smoking factors
6. **Stroke Risk %** = BP × Cholesterol × Diabetes ÷ Age
7. **Diabetes Risk** = (FPG + BMI + Age + Family History Score) ÷ 4
8. **Osteoporosis Risk** = BMD ÷ Young Adult Mean × 100
9. **Sleep Efficiency %** = (Total Sleep ÷ Time in Bed) × 100
10. **Stress Index** = Cortisol ÷ Normal Range × 100

**7. Lifestyle & Recovery (10 formulas)**

1. **Daily Steps Goal** = 10,000 or Activity Factor × Weight
2. **Sleep Debt** = Required Sleep − Actual Sleep
3. **Hydration Gap** = Required Water − Intake
4. **Work-Life Balance %** = Personal Hours ÷ Total Hours × 100
5. **Resting HR Trend** = HR Morning ÷ HR Evening × 100
6. **Calories from Alcohol** = Volume × % × 7.1 ÷ 100
7. **Muscle Recovery Time** = 48–72h × (Intensity %)
8. **Stretch Ratio** = (Stretched Length ÷ Normal Length)
9. **Flexibility Index** = Reach Distance ÷ Height × 100
10. **Wellness Index** = (Sleep + Nutrition + Stress + Activity) ÷ 4

**📘 100 Formulas in Education & Learning**

**1. Basic Arithmetic & Numbers (10 formulas)**

1. Percentage (%) = (Part ÷ Whole) × 100
2. Ratio = a ÷ b
3. Proportion = a/b = c/d
4. Average (Mean) = (Σx) ÷ n
5. Median = Middle value (sorted set)
6. Mode = Most frequent value
7. Simple Interest = (P × R × T) ÷ 100
8. Compound Interest = P × (1 + R/100)^T − P
9. Profit % = (Profit ÷ Cost Price) × 100
10. Loss % = (Loss ÷ Cost Price) × 100

**2. Algebra (10 formulas)**

1. Quadratic Formula = (−b ± √(b² − 4ac)) ÷ 2a
2. (a + b)² = a² + 2ab + b²
3. (a − b)² = a² − 2ab + b²
4. a² − b² = (a + b)(a − b)
5. (x + y + z)² = x² + y² + z² + 2(xy + yz + zx)
6. Arithmetic Progression nth term (An) = a + (n − 1)d
7. Sum of n terms (AP) = n/2 [2a + (n−1)d]
8. Geometric Progression nth term = ar^(n−1)
9. Sum of GP (finite) = a(1−r^n)/(1−r)
10. Infinite GP Sum = a/(1−r), if |r|<1

**3. Geometry (15 formulas)**

1. Area of Square = a²
2. Area of Rectangle = l × b
3. Area of Triangle = ½ × b × h
4. Heron’s Formula = √[s(s−a)(s−b)(s−c)], s=(a+b+c)/2
5. Area of Circle = πr²
6. Circumference = 2πr
7. Volume of Sphere = 4/3 πr³
8. Surface Area of Sphere = 4πr²
9. Volume of Cylinder = πr²h
10. Surface Area of Cylinder = 2πr(h+r)
11. Volume of Cone = ⅓ πr²h
12. Surface Area of Cone = πr(l+r)
13. Pythagoras Theorem = a² + b² = c²
14. Trapezium Area = ½ (a+b)h
15. Rhombus Area = ½ d1 × d2

**4. Trigonometry (15 formulas)**

1. sin²θ + cos²θ = 1
2. tanθ = sinθ ÷ cosθ
3. cotθ = 1 ÷ tanθ
4. secθ = 1 ÷ cosθ
5. cosecθ = 1 ÷ sinθ
6. sin(−θ) = −sinθ; cos(−θ) = cosθ
7. sin(A+B) = sinAcosB + cosAsinB
8. cos(A+B) = cosAcosB − sinAsinB
9. tan(A+B) = (tanA + tanB) ÷ (1 − tanAtanB)
10. Law of Sines = a/sinA = b/sinB = c/sinC
11. Law of Cosines = c² = a²+b²−2ab cosC
12. Area of Triangle (Trig) = ½ ab sinC
13. sin2A = 2sinAcosA
14. cos2A = cos²A − sin²A
15. tan2A = 2tanA ÷ (1−tan²A)

**5. Probability & Statistics (10 formulas)**

1. Probability = (Favorable ÷ Total Outcomes)
2. Odds = P ÷ (1−P)
3. Mean (μ) = Σx/n
4. Variance (σ²) = Σ(x−μ)² ÷ n
5. Standard Deviation = √Variance
6. Permutations = nPr = n! ÷ (n−r)!
7. Combinations = nCr = n! ÷ (r!(n−r)!)
8. Binomial Probability = nCr p^r (1−p)^(n−r)
9. Normal Distribution Z = (X−μ)/σ
10. Expected Value = Σ(x × P(x))

**6. Physics (15 formulas)**

1. Speed = Distance ÷ Time
2. Velocity = Displacement ÷ Time
3. Acceleration = Δv ÷ Δt
4. Force = Mass × Acceleration
5. Work = Force × Distance
6. Power = Work ÷ Time
7. Kinetic Energy = ½ mv²
8. Potential Energy = mgh
9. Pressure = Force ÷ Area
10. Density = Mass ÷ Volume
11. Momentum = Mass × Velocity
12. Impulse = Force × Time
13. Ohm’s Law = V = IR
14. Electrical Power = VI
15. Wave Speed = Frequency × Wavelength

**7. Chemistry (10 formulas)**

1. Molarity = Moles ÷ Volume (L)
2. Molality = Moles ÷ Mass of Solvent (kg)
3. Normality = Equivalents ÷ Volume (L)
4. pH = −log[H⁺]
5. pOH = −log[OH⁻]
6. Kw = [H⁺][OH⁻] = 1×10⁻¹⁴
7. Ideal Gas Law = PV = nRT
8. % Composition = (Mass of Element ÷ Total Mass) × 100
9. Dilution Formula = C₁V₁ = C₂V₂
10. Enthalpy = ΣΔH(products) − ΣΔH(reactants)

**8. Exam & Learning Metrics (10 formulas)**

1. GPA = Σ(Grade Points × Credits) ÷ ΣCredits
2. CGPA = Σ(Semester GPA × Credits) ÷ ΣCredits
3. Percentage = (Marks Obtained ÷ Total Marks) × 100
4. Weighted Average = Σ(wx) ÷ Σw
5. Pass Percentage = (Students Passed ÷ Total Students) × 100
6. Study Efficiency = (Hours Studied ÷ Hours Planned) × 100
7. Learning Retention % = (Info Recalled ÷ Info Learned) × 100
8. Exam Score Improvement % = (New Score−Old Score)/Old Score ×100
9. Question Accuracy % = (Correct ÷ Attempted) × 100
10. Speed (Questions) = Questions Solved ÷ Time

**9. Computer & Digital Learning (10 formulas)**

1. Data Transfer Rate = Data ÷ Time
2. Storage Conversion = 1 KB = 1024 B
3. CPU Efficiency = Useful Work ÷ Total Work × 100
4. Algorithm Complexity = O(n), O(log n), etc.
5. Learning Curve Efficiency = Output ÷ Input × 100

**💼 100 Formulas in Business & Entrepreneurship**

**1. Basic Business Finance (10 formulas)**

1. **Revenue** = Price × Quantity Sold
2. **Gross Profit** = Revenue − COGS
3. **Operating Profit (EBIT)** = Gross Profit − Operating Expenses
4. **Net Profit** = Revenue − (COGS + Expenses + Taxes)
5. **Profit Margin %** = (Net Profit ÷ Revenue) × 100
6. **Gross Margin %** = (Gross Profit ÷ Revenue) × 100
7. **EBITDA** = EBIT + Depreciation + Amortization
8. **EPS (Earnings per Share)** = Net Income ÷ Shares Outstanding
9. **ROE (Return on Equity)** = Net Income ÷ Shareholder Equity × 100
10. **ROA (Return on Assets)** = Net Income ÷ Total Assets × 100

**2. Cash Flow & Liquidity (10 formulas)**

1. **Operating Cash Flow** = Net Income + Non-Cash Expenses − ΔWorking Capital
2. **Free Cash Flow** = OCF − Capital Expenditures
3. **Cash Conversion Cycle (CCC)** = DIO + DSO − DPO
4. **Current Ratio** = Current Assets ÷ Current Liabilities
5. **Quick Ratio** = (Current Assets − Inventory) ÷ Current Liabilities
6. **Working Capital** = Current Assets − Current Liabilities
7. **Liquidity Ratio** = Liquid Assets ÷ Short-term Liabilities
8. **Debt Service Coverage Ratio (DSCR)** = Net Operating Income ÷ Debt Payments
9. **Operating Cash Flow Ratio** = OCF ÷ Current Liabilities
10. **Cash Ratio** = Cash ÷ Current Liabilities

**3. Sales & Marketing Metrics (15 formulas)**

1. **Customer Acquisition Cost (CAC)** = Sales & Marketing Cost ÷ New Customers
2. **Customer Lifetime Value (CLV)** = Avg Value × Gross Margin × Lifespan
3. **ROI on Marketing** = (Revenue from Campaign − Cost) ÷ Cost × 100
4. **Conversion Rate %** = (Conversions ÷ Leads) × 100
5. **Lead-to-Customer %** = (New Customers ÷ Leads) × 100
6. **Sales Growth %** = (Current Sales − Past Sales) ÷ Past Sales × 100
7. **Market Share %** = Company Sales ÷ Industry Sales × 100
8. **Churn Rate %** = (Lost Customers ÷ Total Customers) × 100
9. **Retention Rate %** = 100 − Churn Rate
10. **ARPU (Average Revenue per User)** = Revenue ÷ Users
11. **Sales per Employee** = Revenue ÷ Sales Staff
12. **Upsell Ratio** = Upsell Revenue ÷ Base Revenue × 100
13. **Cost per Lead (CPL)** = Marketing Cost ÷ Leads Generated
14. **Click-through Rate (CTR)** = (Clicks ÷ Impressions) × 100
15. **Return on Ad Spend (ROAS)** = Revenue from Ads ÷ Ad Spend

**4. Operations & Efficiency (10 formulas)**

1. **Inventory Turnover** = COGS ÷ Avg Inventory
2. **Days Inventory Outstanding (DIO)** = 365 ÷ Inventory Turnover
3. **Capacity Utilization %** = (Actual Output ÷ Max Output) × 100
4. **Labor Productivity** = Output ÷ Hours Worked
5. **Machine Utilization %** = Actual Hours ÷ Available Hours × 100
6. **Yield %** = Good Units ÷ Total Units × 100
7. **OEE (Overall Equipment Effectiveness)** = Availability × Performance × Quality
8. **Breakeven Point (Units)** = Fixed Costs ÷ (Price − Variable Cost)
9. **Breakeven Revenue** = Fixed Costs ÷ Contribution Margin Ratio
10. **Contribution Margin %** = (Sales − Variable Costs) ÷ Sales × 100

**5. Entrepreneurship & Growth (10 formulas)**

1. **Burn Rate** = Monthly Expenses − Monthly Revenue
2. **Runway (Months)** = Cash ÷ Burn Rate
3. **Valuation (VC Method)** = Exit Value ÷ ROI Multiple
4. **Price-to-Sales Ratio (P/S)** = Market Cap ÷ Sales
5. **Price-to-Earnings Ratio (P/E)** = Price ÷ EPS
6. **Growth Rate %** = (New Value − Old Value) ÷ Old Value × 100
7. **Rule of 40 (SaaS)** = Growth % + Profit Margin %
8. **Enterprise Value (EV)** = Market Cap + Debt − Cash
9. **EV/EBITDA Ratio** = EV ÷ EBITDA
10. **Market-to-Book Ratio** = Market Value ÷ Book Value

**6. Project Management (10 formulas)**

1. **Planned Value (PV)** = % Planned × Budget
2. **Earned Value (EV)** = % Completed × Budget
3. **Actual Cost (AC)** = Sum of Actual Expenses
4. **Cost Variance (CV)** = EV − AC
5. **Schedule Variance (SV)** = EV − PV
6. **CPI (Cost Performance Index)** = EV ÷ AC
7. **SPI (Schedule Performance Index)** = EV ÷ PV
8. **Estimate at Completion (EAC)** = BAC ÷ CPI
9. **Variance at Completion (VAC)** = BAC − EAC
10. **Critical Path Duration** = Sum of Longest Path Activities

**7. Human Resources (10 formulas)**

1. **Employee Turnover %** = (Leavers ÷ Avg Employees) × 100
2. **Absenteeism %** = (Absent Days ÷ Total Workdays) × 100
3. **Retention %** = (Remaining Staff ÷ Start Staff) × 100
4. **Training ROI %** = (Benefits − Cost) ÷ Cost × 100
5. **Revenue per Employee** = Revenue ÷ Employees
6. **Profit per Employee** = Net Profit ÷ Employees
7. **Cost per Hire** = Recruitment Cost ÷ Hires
8. **Employee Productivity** = Output ÷ Input (hours/cost)
9. **Engagement Index %** = (Engaged Staff ÷ Total Staff) × 100
10. **Salary-to-Revenue Ratio %** = Total Salary ÷ Revenue × 100

**8. Risk & Decision Making (10 formulas)**

1. **Break-even Probability** = Fixed Cost ÷ Contribution Margin
2. **Expected Monetary Value (EMV)** = Σ(Probability × Payoff)
3. **Decision Tree EV** = (Success% × Gain) − (Failure% × Loss)
4. **Risk-Return Ratio** = Expected Return ÷ Standard Deviation
5. **Hedging Effectiveness** = 1 − (Portfolio Variance ÷ Market Variance)
6. **Default Risk %** = Bad Debts ÷ Total Loans × 100
7. **Leverage Ratio** = Total Debt ÷ Equity
8. **Interest Coverage Ratio** = EBIT ÷ Interest
9. **Altman Z-Score** = 1.2×X1 + 1.4×X2 + 3.3×X3 + 0.6×X4 + 1.0×X5
10. **Margin of Safety %** = (Sales − Break-even Sales) ÷ Sales × 100

**9. Economics & Strategy (10 formulas)**

1. **Elasticity of Demand** = (%ΔQ ÷ %ΔP)
2. **Marginal Cost (MC)** = ΔTC ÷ ΔQ
3. **Marginal Revenue (MR)** = ΔTR ÷ ΔQ
4. **Profit Maximization** = MR = MC
5. **Price Elasticity of Supply** = %ΔQs ÷ %ΔP
6. **GDP Contribution %** = Sector GDP ÷ Total GDP × 100
7. **Productivity Growth %** = (Output Growth − Input Growth)
8. **Porter’s ROI Index** = Industry ROI ÷ Firm ROI
9. **Market Concentration (HHI)** = Σ(market share²)
10. **Learning Curve %** = (New Cost ÷ Old Cost) × 100

**10. Digital & E-Business (10 formulas)**

1. **Website Conversion %** = (Purchases ÷ Visitors) × 100
2. **Bounce Rate %** = (Single-page Visits ÷ Total Visits) × 100
3. **Cart Abandonment %** = (Abandoned Carts ÷ Initiated Carts) × 100
4. **Customer Engagement Rate** = Interactions ÷ Followers × 100
5. **Viral Coefficient** = # of Invites × Conversion Rate

**🕒 100 Formulas in Work & Productivity**

**1. Time Management (15 formulas)**

1. **Time Utilization %** = (Productive Hours ÷ Total Hours) × 100
2. **Work Efficiency %** = (Standard Time ÷ Actual Time) × 100
3. **Pomodoro Productivity %** = (Completed Sessions ÷ Planned Sessions) × 100
4. **Time per Task** = Total Time ÷ Tasks Completed
5. **Idle Time %** = (Idle Hours ÷ Total Hours) × 100
6. **Focus Ratio** = Deep Work Hours ÷ Total Work Hours
7. **Task Completion Rate %** = (Completed Tasks ÷ Assigned Tasks) × 100
8. **Overtime %** = (Overtime Hours ÷ Regular Hours) × 100
9. **Schedule Adherence %** = (On-time Tasks ÷ Total Tasks) × 100
10. **Meeting Time %** = (Meeting Hours ÷ Work Hours) × 100
11. **Time Lost to Interruptions %** = (Interrupt Time ÷ Total Time) × 100
12. **Break Efficiency %** = (Recovered Productivity ÷ Break Time) × 100
13. **Workload Balance %** = (Employee Load ÷ Avg Load) × 100
14. **Planned vs Actual Time %** = (Planned ÷ Actual) × 100
15. **Deadline Compliance %** = (Tasks on Time ÷ Total Tasks) × 100

**2. Task & Project Performance (15 formulas)**

1. **Project Completion %** = (Work Done ÷ Total Work) × 100
2. **Milestone Achievement %** = (Completed Milestones ÷ Planned Milestones) × 100
3. **Tasks per Employee** = Tasks ÷ Employees
4. **Backlog %** = (Pending Tasks ÷ Total Tasks) × 100
5. **Defect Density** = Defects ÷ Work Units Completed
6. **Workload Capacity %** = (Work Completed ÷ Max Capacity) × 100
7. **Work in Progress %** = (Ongoing Tasks ÷ Total Tasks) × 100
8. **Task Efficiency %** = (Expected Output ÷ Actual Output) × 100
9. **Planned Value (PV)** = % Planned × Total Budget
10. **Earned Value (EV)** = % Completed × Total Budget
11. **Schedule Variance (SV)** = EV − PV
12. **Cost Variance (CV)** = EV − Actual Cost
13. **SPI (Schedule Performance Index)** = EV ÷ PV
14. **CPI (Cost Performance Index)** = EV ÷ AC
15. **Project Health Index** = (CPI × SPI) × 100

**3. Employee Productivity (15 formulas)**

1. **Output per Employee** = Total Output ÷ Employees
2. **Revenue per Employee** = Revenue ÷ Employees
3. **Profit per Employee** = Net Profit ÷ Employees
4. **Utilization Rate %** = (Billable Hours ÷ Total Hours) × 100
5. **Absenteeism %** = (Absent Days ÷ Workdays) × 100
6. **Turnover %** = (Leavers ÷ Avg Staff) × 100
7. **Retention %** = (Employees Retained ÷ Total Employees) × 100
8. **Overtime Hours %** = Overtime Hours ÷ Total Hours × 100
9. **Engagement Index %** = (Engaged Staff ÷ Total Staff) × 100
10. **Training ROI %** = (Gain − Cost) ÷ Cost × 100
11. **Learning Curve %** = (New Time ÷ Old Time) × 100
12. **Skill Utilization %** = Skills Used ÷ Total Skills × 100
13. **Error Rate %** = (Errors ÷ Total Tasks) × 100
14. **Rework %** = (Rework Hours ÷ Total Hours) × 100
15. **Knowledge Transfer %** = (Knowledge Applied ÷ Knowledge Shared) × 100

**4. Efficiency & Effectiveness (15 formulas)**

1. **Overall Efficiency %** = (Useful Output ÷ Input) × 100
2. **Effectiveness %** = (Achieved Goals ÷ Planned Goals) × 100
3. **Cycle Time** = End Time − Start Time
4. **Throughput** = Units Produced ÷ Time
5. **First Pass Yield %** = (Good Units ÷ Total Units) × 100
6. **Work Quality %** = (Accepted Output ÷ Total Output) × 100
7. **Defect Removal Efficiency %** = (Defects Fixed ÷ Total Defects) × 100
8. **Capacity Utilization %** = (Used Capacity ÷ Available Capacity) × 100
9. **Rework Ratio %** = Rework ÷ Total Work × 100
10. **Cost Efficiency %** = Planned Cost ÷ Actual Cost × 100
11. **Productivity Index** = Output ÷ Input
12. **Service Level %** = On-time Deliveries ÷ Total Deliveries × 100
13. **Satisfaction Score %** = Positive Feedback ÷ Total Feedback × 100
14. **Employee Efficiency %** = (Target Output ÷ Actual Output) × 100
15. **Effectiveness Index** = Efficiency × Quality

**5. Personal Productivity (15 formulas)**

1. **Daily Productivity %** = (Tasks Completed ÷ Planned Tasks) × 100
2. **Weekly Productivity %** = Completed ÷ Planned × 100
3. **Focus Time Ratio** = Deep Work Hours ÷ Total Work Hours
4. **Task Prioritization Index** = (High Priority ÷ Total Tasks) × 100
5. **Time Saved %** = (Old Time − New Time) ÷ Old Time × 100
6. **Interruptions %** = Interrupt Time ÷ Total Work Time × 100
7. **Procrastination Rate %** = (Delayed Tasks ÷ Total Tasks) × 100
8. **Email Time %** = Email Hours ÷ Total Work Hours × 100
9. **Context Switching %** = Switches ÷ Tasks × 100
10. **Learning Retention %** = Recalled ÷ Learned × 100
11. **Self-Improvement %** = Improvement Tasks ÷ Total Tasks × 100
12. **Daily Step Goal %** = Steps Taken ÷ Step Goal × 100
13. **Screen Time %** = Screen Hours ÷ Work Hours × 100
14. **Work-Life Balance %** = Personal Hours ÷ Total Hours × 100
15. **Productivity Growth %** = (New Output − Old Output) ÷ Old Output × 100

**6. Team Productivity (15 formulas)**

1. **Team Efficiency %** = (Output ÷ Effort) × 100
2. **Collaboration Index** = (Team Tasks ÷ Total Tasks) × 100
3. **Task Distribution Balance** = (Max Load − Min Load) ÷ Avg Load × 100
4. **Meeting Effectiveness %** = (Action Items Completed ÷ Action Items Assigned) × 100
5. **Team Engagement %** = Active Members ÷ Total Members × 100
6. **Decision Speed** = Decisions Made ÷ Time
7. **Conflict Resolution %** = Resolved Issues ÷ Reported Issues × 100
8. **Innovation Index** = New Ideas ÷ Total Ideas × 100
9. **Team Alignment %** = Shared Goals ÷ Individual Goals × 100
10. **Task Redundancy %** = Duplicate Tasks ÷ Total Tasks × 100
11. **Communication Effectiveness %** = Understood Messages ÷ Sent Messages × 100
12. **Team Productivity Index** = Team Output ÷ Team Hours
13. **Meeting Load %** = Meeting Hours ÷ Team Hours × 100
14. **Collaboration ROI %** = (Team Output − Individual Output) ÷ Individual Output × 100
15. **Collective Efficiency** = Avg Individual Efficiency × Team Synergy

**7. Digital Productivity & Tech (10 formulas)**

1. **Automation ROI %** = (Time Saved × Cost per Hour − Cost) ÷ Cost × 100
2. **System Uptime %** = Uptime ÷ Total Time × 100
3. **Error Rate % (IT)** = Errors ÷ Transactions × 100
4. **Bug Fix Efficiency %** = Bugs Fixed ÷ Bugs Reported × 100
5. **System Productivity** = Transactions ÷ Processing Time
6. **Cloud Cost Efficiency %** = Planned Cost ÷ Actual Cost × 100
7. **App Usage %** = App Hours ÷ Total Work Hours × 100
8. **Digital Collaboration Index** = Online Tasks ÷ Total Tasks × 100
9. **Automation Coverage %** = Automated Processes ÷ Total Processes × 100
10. **AI Productivity Gain %** = (AI Output ÷ Human Output) × 100

**🔬 100 Formulas in Science & Technology**

**1. Physics – Mechanics (15 formulas)**

1. Speed = Distance ÷ Time
2. Velocity = Displacement ÷ Time
3. Acceleration = Δv ÷ Δt
4. Force = Mass × Acceleration (F = ma)
5. Momentum = Mass × Velocity (p = mv)
6. Impulse = Force × Time
7. Work = Force × Distance × cosθ
8. Power = Work ÷ Time
9. Kinetic Energy = ½ mv²
10. Potential Energy = mgh
11. Mechanical Energy = KE + PE
12. Torque = Force × Lever Arm
13. Angular Momentum = I × ω
14. Newton’s Second Law = F = dp/dt
15. Pressure = Force ÷ Area

**2. Physics – Waves & Thermodynamics (10 formulas)**

1. Wave Speed = Frequency × Wavelength
2. Frequency = 1 ÷ Period
3. Snell’s Law = n₁sinθ₁ = n₂sinθ₂
4. Heat Transfer (Q) = mcΔT
5. Specific Heat Capacity = Q ÷ (mΔT)
6. Ideal Gas Law = PV = nRT
7. Boyle’s Law = P₁V₁ = P₂V₂
8. Charles’ Law = V₁/T₁ = V₂/T₂
9. Thermal Efficiency = Work ÷ Heat Input × 100
10. Carnot Efficiency = 1 − (Tc ÷ Th)

**3. Physics – Electricity & Magnetism (15 formulas)**

1. Ohm’s Law = V = IR
2. Electrical Power = VI
3. Resistance = ρL ÷ A
4. Capacitance = Q ÷ V
5. Energy in Capacitor = ½ CV²
6. Coulomb’s Law = k(q₁q₂ ÷ r²)
7. Electric Field = F ÷ q
8. Magnetic Force = qvB sinθ
9. Ampere’s Law = B × 2πr = μ₀I
10. Induced EMF = −dΦ/dt
11. Inductor Energy = ½ LI²
12. Transformer Ratio = Vp ÷ Vs = Np ÷ Ns
13. Power Factor = cosθ = P ÷ (VI)
14. Conductance = 1 ÷ Resistance
15. Kirchhoff’s Law → ΣI = 0, ΣV = 0

**4. Physics – Modern Science (10 formulas)**

1. Einstein’s Mass-Energy = E = mc²
2. Photoelectric Effect = E = hf − φ
3. De Broglie Wavelength = h ÷ p
4. Heisenberg Principle = ΔxΔp ≥ ħ/2
5. Relativistic Mass = m = m₀ ÷ √(1−v²/c²)
6. Lorentz Factor = γ = 1 ÷ √(1−v²/c²)
7. Nuclear Half-life = ln2 ÷ λ
8. Radioactive Decay = N = N₀e^(-λt)
9. Energy of Photon = E = hf = hc ÷ λ
10. Binding Energy per Nucleon = BE ÷ A

**5. Chemistry (15 formulas)**

1. Molarity = Moles ÷ Volume (L)
2. Molality = Moles ÷ Solvent Mass (kg)
3. Normality = Equivalents ÷ Volume (L)
4. Mole Fraction = Moles of Component ÷ Total Moles
5. % Composition = (Mass of Element ÷ Molar Mass) × 100
6. Ideal Gas Law = PV = nRT
7. pH = −log[H⁺]
8. pOH = −log[OH⁻]
9. Kw = [H⁺][OH⁻] = 1×10⁻¹⁴
10. Gibbs Free Energy = ΔG = ΔH − TΔS
11. ΔG = −nFE (electrochemistry)
12. Rate Law = k[A]^m[B]^n
13. Half-life (1st order) = 0.693 ÷ k
14. Henderson-Hasselbalch = pH = pKa + log([A⁻]/[HA])
15. Beer-Lambert Law = A = εcl

**6. Biology / Human Science (10 formulas)**

1. BMI = Weight ÷ Height²
2. BMR = 10W + 6.25H − 5A + s
3. Growth Rate % = (ΔPopulation ÷ Initial) × 100
4. Hardy-Weinberg Eq. = p² + 2pq + q² = 1
5. Doubling Time = ln2 ÷ Growth Rate
6. Metabolic Rate = Energy Expended ÷ Time
7. Enzyme Activity = Product ÷ Time
8. Blood Pressure Mean = (SBP + 2DBP)/3
9. Respiration Quotient = CO₂ Produced ÷ O₂ Consumed
10. DNA Base Pair Rule = A=T, G≡C

**7. Computer Science & Technology (15 formulas)**

1. Data Transfer Rate = Data ÷ Time
2. CPU Utilization % = (Busy Time ÷ Total Time) × 100
3. Latency = Response Time − Processing Time
4. Throughput = Tasks ÷ Time
5. Speedup = Old Time ÷ New Time
6. Efficiency = Speedup ÷ Processors × 100
7. Memory Access Time = Hit Ratio×Cache + Miss Ratio×Main
8. Reliability = MTBF ÷ (MTBF + MTTR)
9. Availability % = MTBF ÷ (MTBF+MTTR) × 100
10. Algorithm Complexity ≈ O(n), O(n log n), etc.
11. Shannon Entropy = −Σp log₂(p)
12. Compression Ratio = Original Size ÷ Compressed Size
13. Network Utilization % = (Actual Throughput ÷ Max Bandwidth) × 100
14. Packet Loss % = (Lost Packets ÷ Sent Packets) × 100
15. Hash Collision Probability ≈ 1 − e^(−k²/2n)

**8. Engineering & Technology (10 formulas)**

1. Stress = Force ÷ Area
2. Strain = ΔL ÷ L
3. Young’s Modulus = Stress ÷ Strain
4. Shear Stress = Force ÷ Area (parallel)
5. Bending Moment = Force × Distance
6. Efficiency % = Output ÷ Input × 100
7. Thermal Conductivity (q) = kA(ΔT ÷ d)
8. Pump Power = ρghQ ÷ Efficiency
9. Efficiency of Engine = Output Work ÷ Heat Supplied × 100
10. Safety Factor = Ultimate Stress ÷ Working Stress

**🏗️ 100 Formulas in Construction & Engineering**

**1. General Civil Engineering (10 formulas)**

1. **Density** = Mass ÷ Volume
2. **Unit Weight (γ)** = Weight ÷ Volume
3. **Stress (σ)** = Force ÷ Area
4. **Strain (ε)** = ΔL ÷ L
5. **Young’s Modulus (E)** = Stress ÷ Strain
6. **Shear Stress (τ)** = Shear Force ÷ Area
7. **Poisson’s Ratio (ν)** = Lateral Strain ÷ Longitudinal Strain
8. **Bulk Modulus (K)** = Volumetric Stress ÷ Volumetric Strain
9. **Factor of Safety (FoS)** = Ultimate Stress ÷ Working Stress
10. **Bearing Capacity (qult)** = (1.3 × Nc × c) + γDf × Nq + 0.4γBNγ

**2. Concrete & Materials (10 formulas)**

1. **Water-Cement Ratio (w/c)** = Weight of Water ÷ Weight of Cement
2. **Concrete Mix Design** = Cement : Sand : Aggregate : Water
3. **Slump % Loss** = (Initial Slump − Final Slump) ÷ Initial Slump × 100
4. **Compressive Strength** = Load ÷ Area
5. **Modulus of Rupture** = 0.7 × √fck
6. **Cement Content** = w/c × Water Content
7. **Aggregate Gradation %** = (Retained ÷ Total Sample) × 100
8. **Concrete Volume** = Length × Breadth × Depth
9. **Curing Water Requirement** = Surface Area × Water Demand
10. **Shrinkage %** = (Initial Length − Final Length) ÷ Initial Length × 100

**3. Structural Engineering (15 formulas)**

1. **Bending Stress** = M × y ÷ I
2. **Shear Stress** = V × Q ÷ (I × b)
3. **Moment of Inertia (Rect.)** = (bd³) ÷ 12
4. **Moment of Inertia (Circle)** = πd⁴ ÷ 64
5. **Section Modulus (Z)** = I ÷ y
6. **Flexural Strength** = σ = M/Z
7. **Euler’s Buckling Load** = π²EI ÷ (KL)²
8. **Slenderness Ratio** = L ÷ r
9. **Deflection (Beam, WL/48EI)** = (5wL⁴) ÷ (384EI)
10. **Fixed Beam Deflection (WL/192EI)** = (wL⁴) ÷ (384EI)
11. **Cantilever Deflection (WL³/3EI)** = (wL³) ÷ (3EI)
12. **Shear Force (V)** = ΣVertical Forces
13. **Bending Moment (M)** = Σ(F × Distance)
14. **Truss Force (Method of Joints)** = ΣFx=0, ΣFy=0
15. **Stability Condition** = m + r ≥ 2j

**4. Surveying & Geotechnical (10 formulas)**

1. **Level Difference** = HI − RL
2. **Gradient (Slope)** = Rise ÷ Run
3. **Trapezoidal Rule (Area)** = (d/2)[(y₁+yₙ) + 2Σy]
4. **Simpson’s Rule (Area)** = d/3[(y₀ + yₙ) + 4Σyodd + 2Σyeven]
5. **Volume (Earthwork)** = (A₁ + A₂)/2 × L
6. **Prismoidal Formula (Volume)** = L/3(A₁ + A₂ + √(A₁×A₂))
7. **R.L. (Rise & Fall)** = B.S − F.S
8. **Safe Bearing Capacity** = Load ÷ Foundation Area
9. **Soil Void Ratio (e)** = Vv ÷ Vs
10. **Porosity (n)** = Vv ÷ V × 100

**5. Transportation & Roads (10 formulas)**

1. **Stopping Sight Distance (SSD)** = vt + v²/2gf
2. **Overtaking Sight Distance (OSD)** = d₁+d₂+d₃
3. **Super Elevation (e)** = V² ÷ (gR)
4. **Curve Length (L)** = R × Δ (in radians)
5. **Grade %** = (Vertical Rise ÷ Horizontal Distance) × 100
6. **Traffic Density** = Vehicles ÷ Road Length
7. **Traffic Flow (Q)** = Density × Speed
8. **PCU (Passenger Car Unit)** = Σ(Vehicle Type × PCU Factor)
9. **Bitumen Content** = Weight of Bitumen ÷ Total Mix Weight × 100
10. **Pavement Thickness** = P × √(W/E)

**6. Hydraulics & Fluid Mechanics (10 formulas)**

1. **Discharge (Q)** = A × V
2. **Continuity Eq.** = A₁V₁ = A₂V₂
3. **Bernoulli’s Eq.** = P/ρg + v²/2g + z = constant
4. **Reynolds Number** = ρVD ÷ μ
5. **Darcy-Weisbach Head Loss** = h\_f = f(L/D)(V²/2g)
6. **Manning’s Equation** = V = (1/n)R^(2/3)S^(1/2)
7. **Hydraulic Radius (R)** = A ÷ P
8. **Weir Discharge** = (2/3)Cd b√(2g)H^(3/2)
9. **Orifice Flow** = Cd × A × √(2gH)
10. **Pump Power** = ρgQH ÷ η

**7. Mechanical & Thermal Engineering (10 formulas)**

1. **Work Done (Gas)** = P × ΔV
2. **Power** = Work ÷ Time
3. **Efficiency %** = Output ÷ Input × 100
4. **Otto Cycle Efficiency** = 1 − (1/r^(γ−1))
5. **Diesel Cycle Efficiency** = 1 − [(r^(γ−1))(ρ^γ−1)] ÷ (γ(ρ−1))
6. **Brake Power (BP)** = 2πNT ÷ 60
7. **Indicated Power (IP)** = (pmi × L × A × n × k) ÷ 60
8. **Mechanical Efficiency** = BP ÷ IP × 100
9. **Heat Transfer (Q)** = mcΔT
10. **Thermal Conductivity (q)** = kA(ΔT ÷ d)

**8. Electrical & Electronics (10 formulas)**

1. **Ohm’s Law** = V = IR
2. **Power** = VI
3. **AC Power** = VIcosφ
4. **Energy Consumption** = P × t
5. **Capacitance** = Q ÷ V
6. **Inductor Energy** = ½ LI²
7. **Transformer Ratio** = Vp ÷ Vs = Np ÷ Ns
8. **Current Divider Rule** = I₁ = IT(R₂/(R₁+R₂))
9. **Voltage Divider Rule** = Vout = Vin(R₂/(R₁+R₂))
10. **Power Factor** = Real Power ÷ Apparent Power

**9. Construction Management (10 formulas)**

1. **Productivity** = Output ÷ Input
2. **Labor Productivity** = Work Done ÷ Labor Hours
3. **Equipment Utilization %** = Actual Hours ÷ Available Hours × 100
4. **Cost Variance (CV)** = EV − AC
5. **Schedule Variance (SV)** = EV − PV
6. **CPI** = EV ÷ AC
7. **SPI** = EV ÷ PV
8. **Overhead %** = Overhead Costs ÷ Direct Costs × 100
9. **Construction Cost Index** = Current Cost ÷ Base Cost × 100
10. **Earned Value (EV)** = % Completed × Total Budget

**10. Environmental & Safety Engineering (5 formulas)**

1. **Noise Level (dB)** = 10 log₁₀(I/I₀)
2. **Air Quality Index (AQI)** = (Pollutant ÷ Standard) × 100
3. **Ventilation Rate** = Air Changes ÷ Hour
4. **Dust Concentration** = Particles ÷ Volume of Air
5. **Safety Incident Rate** = (Incidents × 200,000) ÷ Employee Hours

**🚗✈️🚆🚢 100 Formulas in Travel & Transportation**

**1. Basic Travel Formulas (10)**

1. **Speed** = Distance ÷ Time
2. **Distance** = Speed × Time
3. **Time** = Distance ÷ Speed
4. **Average Speed** = Total Distance ÷ Total Time
5. **Travel Efficiency %** = (Direct Distance ÷ Actual Distance) × 100
6. **Layover Delay %** = (Layover Time ÷ Total Travel Time) × 100
7. **Effective Travel Speed** = Total Distance ÷ (Travel Time + Delay)
8. **Round Trip Time** = Outbound Time + Return Time
9. **Journey Breaks %** = (Break Time ÷ Total Trip Time) × 100
10. **Route Utilization %** = (Used Route ÷ Available Routes) × 100

**2. Fuel & Energy Efficiency (15)**

1. **Fuel Efficiency** = Distance ÷ Fuel Used
2. **Fuel Consumption** = Fuel Used ÷ Distance
3. **Mileage (km/L)** = Distance ÷ Liters
4. **Mileage (mpg)** = Miles ÷ Gallons
5. **Cost per km** = Fuel Cost ÷ Distance
6. **Fuel Cost for Trip** = Distance × (Fuel Used ÷ Distance) × Fuel Price
7. **EV Energy Use** = kWh ÷ Distance
8. **EV Range** = Battery Capacity ÷ Consumption Rate
9. **Hybrid Efficiency %** = EV Miles ÷ Total Miles × 100
10. **Idling Fuel Waste** = Fuel/hr × Idling Hours
11. **Carbon Emission (CO₂)** = Fuel Used × Emission Factor
12. **Emission per Passenger** = Total Emission ÷ Passengers
13. **Eco Driving Score %** = (Standard ÷ Actual Consumption) × 100
14. **Fuel Saving %** = (Old Consumption − New) ÷ Old × 100
15. **Payload Fuel Penalty** = Extra Fuel ÷ Extra Weight

**3. Road Transport & Driving (15)**

1. **Stopping Sight Distance (SSD)** = vt + v²/2gf
2. **Overtaking Sight Distance (OSD)** = d₁ + d₂ + d₃
3. **Braking Distance** = v² ÷ 2μg
4. **Reaction Distance** = vt
5. **Deceleration** = v² ÷ 2s
6. **Super Elevation (e)** = v² ÷ gR
7. **Traffic Flow (Q)** = Density × Speed
8. **Traffic Density** = Vehicles ÷ Length of Road
9. **PCU (Passenger Car Unit)** = Σ(Vehicles × PCU Factor)
10. **Vehicle Load Factor %** = Passengers ÷ Capacity × 100
11. **Vehicle Utilization %** = Used Days ÷ Available Days × 100
12. **Highway Capacity** = Flow ÷ Lane × Lanes
13. **Congestion Index** = Actual Speed ÷ Free Speed × 100
14. **Delay Factor %** = (Delayed Time ÷ Travel Time) × 100
15. **Travel Time Index** = Peak Time ÷ Free Flow Time

**4. Rail Transport (10)**

1. **Train Speed** = Distance ÷ Time
2. **Headway Time** = Spacing ÷ Speed
3. **Rail Capacity** = 3600 ÷ Headway
4. **Track Utilization %** = Train Hours ÷ Track Hours × 100
5. **Load Factor %** = Actual Passengers ÷ Capacity × 100
6. **Ton-km** = Weight × Distance
7. **Passenger-km** = Passengers × Distance
8. **Energy per Passenger-km** = kWh ÷ Passenger-km
9. **Delay Index %** = (Delay ÷ Scheduled Time) × 100
10. **Turnaround Time** = Arrival to Next Departure

**5. Air Transport (15)**

1. **Flight Time** = Distance ÷ Speed
2. **Block Time** = Gate Out − Gate In
3. **Payload Ratio** = Payload ÷ Max Payload × 100
4. **Passenger Load Factor** = RPK ÷ ASK × 100
5. **Revenue Passenger km (RPK)** = Passengers × Distance
6. **Available Seat km (ASK)** = Seats × Distance
7. **Fuel Burn Rate** = Fuel ÷ Time
8. **Fuel Efficiency (Airline)** = RPK ÷ Fuel Used
9. **On-Time Performance %** = On-time Flights ÷ Total Flights × 100
10. **Delay Cost** = Delay Hours × Cost/hr
11. **Flight Range (Breguet)** = (V/gc) × (L/D) × ln(Wi/Wf)
12. **Ground Delay %** = Ground Delay ÷ Total Delay × 100
13. **Air Cargo Load Factor** = Freight Tonne-km ÷ Available Freight Tonne-km
14. **Runway Occupancy Time** = Time Aircraft Stays on Runway
15. **Turnaround Efficiency %** = Planned ÷ Actual Turnaround × 100

**6. Maritime / Shipping (10)**

1. **Deadweight Tonnage (DWT)** = Cargo + Fuel + Crew + Provisions
2. **Gross Tonnage (GT)** = Volume of All Enclosed Spaces ÷ 100
3. **Cargo Utilization %** = Actual Cargo ÷ DWT × 100
4. **Fuel Consumption per Nautical Mile** = Fuel ÷ Distance
5. **Knots (Speed)** = Nautical Miles ÷ Hour
6. **Port Time %** = Port Hours ÷ Total Voyage Hours × 100
7. **Cargo Handling Rate** = Cargo ÷ Hours
8. **Turnaround Time** = Arrival − Departure
9. **Ballast Ratio** = Ballast ÷ Total Weight
10. **Ship Efficiency Index** = Cargo Tonnes ÷ Fuel Tonnes

**7. Logistics & Supply Chain (15)**

1. **Lead Time** = Order Time − Delivery Time
2. **Cycle Time** = Processing Time + Transport Time
3. **On-time Delivery %** = On-time ÷ Total Deliveries × 100
4. **Order Accuracy %** = Correct Orders ÷ Total Orders × 100
5. **Freight Cost per km** = Freight Cost ÷ Distance
6. **Freight Cost per Tonne** = Freight Cost ÷ Tonnage
7. **Load Factor %** = Actual Load ÷ Vehicle Capacity × 100
8. **Utilization Rate %** = Time in Use ÷ Total Time × 100
9. **Empty Run %** = Empty Distance ÷ Total Distance × 100
10. **Logistics Cost %** = Logistics ÷ Sales × 100
11. **Inventory Turnover** = COGS ÷ Average Inventory
12. **Supply Chain Cycle Efficiency (SCCE)** = Value-added Time ÷ Total Time
13. **Dock Utilization %** = Dock Time ÷ Total Time × 100
14. **Freight Productivity** = Tonne-km ÷ Fuel Used
15. **Damage Ratio %** = Damaged Goods ÷ Total Goods × 100

**8. Navigation & Mapping (10)**

1. **Bearing Conversion** = Azimuth → Bearing
2. **Latitude Difference** = ΔLat = Lat₂ − Lat₁
3. **Longitude Difference** = ΔLon = Lon₂ − Lon₁
4. **Great Circle Distance** = R × cos⁻¹(sinφ₁sinφ₂ + cosφ₁cosφ₂cosΔλ)
5. **Rhumb Line Distance** = ΔLat ÷ cos(Mean Lat)
6. **GPS Error %** = Error ÷ Actual Distance × 100
7. **Waypoint ETA** = Distance ÷ Speed
8. **Fuel per Leg** = Fuel/hr × Hours per Leg
9. **Navigation Drift %** = Actual Path ÷ Planned Path × 100
10. **Mapping Scale** = Map Distance ÷ Ground Distance

**🏠 100 Formulas in Household & Lifestyle**

**1. Household Budget & Expenses (15 formulas)**

1. **Monthly Savings** = Income − Expenses
2. **Expense Ratio %** = (Expenses ÷ Income) × 100
3. **Housing Cost %** = (Rent ÷ Income) × 100
4. **Utility Cost %** = (Utilities ÷ Income) × 100
5. **Food Cost %** = (Food ÷ Income) × 100
6. **Debt-to-Income %** = (Debt Payments ÷ Income) × 100
7. **Subscription Share %** = (Subscriptions ÷ Income) × 100
8. **Emergency Fund Goal** = 6 × Monthly Expenses
9. **Monthly Allowance** = Budget ÷ Household Members
10. **Expense Growth %** = (New Expense − Old) ÷ Old × 100
11. **Savings Rate %** = (Savings ÷ Income) × 100
12. **Cost per Day Living** = Monthly Expense ÷ 30
13. **Household Productivity Index** = Tasks Completed ÷ Planned Tasks
14. **Debt Repayment %** = Paid Debt ÷ Total Debt × 100
15. **Grocery Budget Share %** = Grocery ÷ Income × 100

**2. Utilities (Electricity, Water, Gas) (15 formulas)**

1. **Electricity Bill** = kWh × Tariff
2. **Appliance Power Use** = Wattage × Hours ÷ 1000
3. **Cost per Appliance** = Appliance kWh × Rate
4. **Energy Efficiency %** = Useful Output ÷ Input × 100
5. **Standby Loss %** = (Standby kWh ÷ Total kWh) × 100
6. **Water Usage per Person** = Total Liters ÷ Members
7. **Daily Water Need** = 30 × Weight (kg)
8. **Water Bill** = Volume (m³) × Rate
9. **Gas Consumption** = Flow Rate × Hours
10. **Gas Bill** = Consumption × Unit Rate
11. **Lighting Efficiency %** = Lumens ÷ Watts
12. **Solar Power Generated** = Area × Efficiency × Sunlight hrs × 1000
13. **Battery Backup Time** = Battery Capacity ÷ Load Power
14. **CO₂ Emission (Electricity)** = kWh × Emission Factor
15. **Appliance Load Factor %** = Avg Load ÷ Max Load × 100

**3. Cooking & Kitchen (15 formulas)**

1. **Recipe Ratio** = Ingredient ÷ Servings
2. **Serving Size** = Total Quantity ÷ Servings
3. **Calorie per Meal** = Σ(Ingredient Calories)
4. **Protein Ratio %** = Protein Cal ÷ Total Cal × 100
5. **Sugar Ratio %** = Sugar g ÷ Total g × 100
6. **Baking Conversion** = °C = (°F − 32) ÷ 1.8
7. **Cooking Time Adjustment** = Old Time × (New Temp ÷ Old Temp)
8. **Food Wastage %** = Wasted ÷ Total × 100
9. **Cost per Meal** = Total Ingredients ÷ Servings
10. **Salt per Person** = 5 g/day ÷ Household Members
11. **Cooking Energy Cost** = Appliance Power × Time × Tariff
12. **Meal Frequency %** = Meals Taken ÷ Meals Planned × 100
13. **Food Inflation %** = (New Price − Old Price) ÷ Old Price × 100
14. **Storage Loss %** = Lost Quantity ÷ Stored Quantity × 100
15. **Leftover Ratio %** = Leftover ÷ Cooked × 100

**4. Health & Wellness at Home (10 formulas)**

1. **BMI** = Weight ÷ Height²
2. **BMR (Mifflin St-Jeor)** = 10W + 6.25H − 5A + s
3. **Daily Water Need** = 30 ml × Body Weight (kg)
4. **Calorie Burn (Walking)** = Distance × Weight × 0.57
5. **Calorie Burn (House Chores)** = MET × Weight × Duration ÷ 60
6. **Sleep Efficiency %** = Sleep Hours ÷ Time in Bed × 100
7. **Stress Index %** = Stress Hours ÷ Work Hours × 100
8. **Household Health Index** = (Healthy Days ÷ Total Days) × 100
9. **Sick Leave %** = Sick Days ÷ Total Days × 100
10. **Screen Time %** = Screen Hours ÷ Day Hours × 100

**5. Home Maintenance (10 formulas)**

1. **Paint Needed** = Area ÷ Coverage per Liter
2. **Flooring Material** = Length × Breadth
3. **Tile Count** = Floor Area ÷ Tile Area
4. **Roof Area (Sloped)** = Length × Width ÷ cos(slope)
5. **Plumbing Flow Rate** = Volume ÷ Time
6. **HVAC Load** = Area × Cooling Factor
7. **Maintenance Cost %** = Repair Cost ÷ Asset Value × 100
8. **Appliance Life Expectancy %** = Used Life ÷ Expected Life × 100
9. **Cleaning Time** = Area ÷ Cleaning Speed
10. **Household Energy Index** = Energy Use ÷ Household Size

**6. Lifestyle & Personal (15 formulas)**

1. **Clothing Cost %** = Clothing ÷ Income × 100
2. **Entertainment Budget %** = Entertainment ÷ Income × 100
3. **Vacation Savings %** = Vacation ÷ Income × 100
4. **Pet Cost %** = Pet Expenses ÷ Income × 100
5. **Fitness Expense %** = Fitness ÷ Income × 100
6. **Work-Life Balance %** = Personal Hours ÷ Total Hours × 100
7. **Leisure Time %** = Leisure Hours ÷ Day Hours × 100
8. **Social Engagement %** = Events ÷ Invitations × 100
9. **Hobby Time %** = Hobby Hours ÷ Free Hours × 100
10. **Household Happiness Index** = (Positive Days ÷ Total Days) × 100
11. **Daily Step Goal %** = Steps Taken ÷ Goal × 100
12. **Sleep Debt** = Required Sleep − Actual Sleep
13. **Family Time %** = Family Hours ÷ Day Hours × 100
14. **Stress-Free Days %** = Stress-Free ÷ Total Days × 100
15. **Wellness Index** = (Sleep + Exercise + Nutrition)/3

**7. Cleaning & Hygiene (10 formulas)**

1. **Laundry Load** = Weight of Clothes ÷ Machine Capacity
2. **Detergent Dosage** = Clothes Weight × Detergent Ratio
3. **Water Use (Laundry)** = Water Liters ÷ Load
4. **Cleaning Efficiency %** = Dirt Removed ÷ Dirt Present × 100
5. **Soap Cost per Wash** = Soap Volume × Cost per ml
6. **Waste Segregation %** = Sorted Waste ÷ Total Waste × 100
7. **Recycling %** = Recycled ÷ Total Waste × 100
8. **Household Hygiene Score** = Cleanliness Tasks Done ÷ Planned × 100
9. **Odor Control %** = Fresh Days ÷ Total Days × 100
10. **Pest Index %** = Pest-free Days ÷ Total Days × 100

**8. Gardening & Outdoor (10 formulas)**

1. **Irrigation Water Need** = Area × Depth × 1000
2. **Fertilizer Dosage** = Soil Requirement × Area
3. **Crop Yield %** = Harvest ÷ Expected × 100
4. **Plant Survival Rate %** = Surviving ÷ Planted × 100
5. **Growth Rate %** = (Final Height − Initial) ÷ Initial × 100
6. **Garden Coverage %** = Garden Area ÷ Plot Area × 100
7. **Compost Ratio** = Browns ÷ Greens
8. **Sunlight Hours %** = Sunlight Hours ÷ Day Hours × 100
9. **Water Efficiency %** = Water Used ÷ Water Required × 100
10. **Oxygen Contribution Index** = Plants ÷ Area

**🏢 100 Formulas in Real Estate & Property**

**1. Property Valuation Basics (10 formulas)**

1. **Property Value (Income Approach)** = Net Operating Income ÷ Cap Rate
2. **Property Value (Sales Comparison)** = Comparable Price × Adjustment Factor
3. **Gross Rent Multiplier (GRM)** = Property Price ÷ Annual Rent
4. **Capitalization Rate (Cap Rate)** = NOI ÷ Property Value × 100
5. **Price per Square Foot** = Property Price ÷ Area (sqft)
6. **Land Value** = Comparable Land Price ÷ Land Area
7. **Replacement Cost** = Cost per Sqft × Built-up Area
8. **Depreciated Value** = Replacement Cost − Depreciation
9. **Effective Age** = (Chronological Age × Condition Factor)
10. **Remaining Economic Life** = Total Life − Effective Age

**2. Mortgage & Loan (15 formulas)**

1. **Monthly EMI** = [P × r × (1+r)^n] ÷ [(1+r)^n − 1]
2. **Loan-to-Value Ratio (LTV)** = Loan ÷ Property Value × 100
3. **Loan Affordability** = 28% × Gross Monthly Income
4. **Debt Service Coverage Ratio (DSCR)** = NOI ÷ Debt Payments
5. **Interest Payment (Monthly)** = Principal × Rate ÷ 12
6. **Principal Payment (Monthly)** = EMI − Interest Payment
7. **Outstanding Loan Balance** = EMI × Remaining Months
8. **Effective Interest Rate** = (1 + (i/n))^n − 1
9. **Amortization (nth Payment Interest)** = Remaining Principal × r ÷ 12
10. **Balloon Payment** = Loan Principal − Paid Installments × EMI
11. **Mortgage Constant** = Annual Debt Service ÷ Loan Principal
12. **Housing Expense Ratio** = PITI ÷ Gross Income × 100
13. **Gross Debt Service Ratio (GDS)** = (Housing Costs ÷ Income) × 100
14. **Total Debt Service Ratio (TDS)** = (All Debts ÷ Income) × 100
15. **Break-even Interest Rate** = EMI ÷ Principal × 100

**3. Rental Investment (15 formulas)**

1. **Rental Yield %** = (Annual Rent ÷ Property Value) × 100
2. **Net Rental Yield %** = (Rent − Expenses) ÷ Property Value × 100
3. **Rent-to-Value Ratio** = Monthly Rent ÷ Property Value × 100
4. **Rent Affordability** = Rent ÷ Income × 100
5. **Vacancy Rate %** = Vacant Units ÷ Total Units × 100
6. **Occupancy Rate %** = Occupied ÷ Total Units × 100
7. **Operating Expense Ratio (OER)** = Expenses ÷ Rent × 100
8. **Effective Gross Income (EGI)** = Potential Rent − Vacancy Losses
9. **Net Operating Income (NOI)** = EGI − Operating Expenses
10. **Cash Flow Before Tax (CFBT)** = NOI − Debt Service
11. **Cash Flow After Tax (CFAT)** = CFBT − Taxes
12. **Cash-on-Cash Return %** = CFAT ÷ Invested Cash × 100
13. **Payback Period** = Investment ÷ Annual Net Cash Flow
14. **Break-even Occupancy %** = Expenses ÷ Gross Rent × 100
15. **Rent Escalation %** = (New Rent − Old Rent) ÷ Old Rent × 100

**4. Investment & ROI (15 formulas)**

1. **Return on Investment (ROI)** = (Profit ÷ Cost) × 100
2. **Return on Equity (ROE)** = CFAT ÷ Equity × 100
3. **Internal Rate of Return (IRR)** = r where NPV=0
4. **NPV (Net Present Value)** = Σ(CFt ÷ (1+r)^t) − Initial Cost
5. **Discounted Payback Period** = Years until NPV ≥ 0
6. **Profitability Index (PI)** = PV of Cash Inflows ÷ PV of Outflows
7. **Annualized Return %** = [(FV ÷ PV)^(1/n) − 1] × 100
8. **Equity Multiple** = Total Returns ÷ Equity Invested
9. **Leverage Ratio** = Total Debt ÷ Equity
10. **IRR Spread** = Project IRR − Cost of Capital
11. **CapEx Ratio %** = CapEx ÷ NOI × 100
12. **Operating Expense %** = OpEx ÷ Gross Income × 100
13. **Investment Multiplier** = Total Returns ÷ Initial Cost
14. **Yield on Cost (YoC)** = NOI ÷ Project Cost × 100
15. **Risk-Adjusted Return** = Return ÷ Standard Deviation

**5. Construction & Development (10 formulas)**

1. **Construction Cost** = Area × Cost per Sqft
2. **Built-up Area** = Carpet Area × Loading Factor
3. **Floor Area Ratio (FAR)** = Total Built-up ÷ Plot Area
4. **FSI (Floor Space Index)** = Built-up ÷ Land Area
5. **Plinth Area** = External Building Area at Ground Floor
6. **Super Built-up Area** = Carpet Area + Common Area Share
7. **Cost per Sqft** = Total Cost ÷ Area
8. **Material Cost %** = Material Cost ÷ Project Cost × 100
9. **Labor Cost %** = Labor ÷ Project Cost × 100
10. **Overhead %** = Overhead ÷ Project Cost × 100

**6. Taxes & Fees (10 formulas)**

1. **Stamp Duty** = Property Value × Duty %
2. **Registration Fee** = Property Value × Fee %
3. **Transfer Tax** = Sale Price × Tax %
4. **Property Tax** = Annual Rental Value × Tax Rate
5. **Capital Gains Tax** = (Sale − Cost − Improvements) × Rate
6. **Wealth Tax** = Net Property Value × Rate
7. **Depreciation (Straight-line)** = Cost ÷ Useful Life
8. **Depreciation (Declining Balance)** = Opening WDV × Rate
9. **Tax Shield** = Interest × Tax Rate
10. **After-Tax Cash Flow** = CFAT = CFBT − Taxes

**7. Real Estate Economics (10 formulas)**

1. **Absorption Rate %** = Sold Units ÷ Available Units × 100
2. **Housing Affordability Index** = (Median Income ÷ Qualifying Income) × 100
3. **Price-to-Rent Ratio** = Property Price ÷ Annual Rent
4. **Price-to-Income Ratio** = Median House Price ÷ Median Household Income
5. **Market Value Index** = Current Price ÷ Base Price × 100
6. **Property Inflation %** = (New Price − Old Price) ÷ Old Price × 100
7. **GDP Contribution %** = Real Estate GDP ÷ National GDP × 100
8. **Construction Growth %** = (New Construction − Old) ÷ Old × 100
9. **Housing Demand Index** = Demand ÷ Supply × 100
10. **Vacancy Absorption %** = Absorbed ÷ Vacant × 100

**8. Risk & Portfolio Management (10 formulas)**

1. **Default Risk %** = Loan Defaults ÷ Loans × 100
2. **Liquidity Ratio** = Quick Assets ÷ Liabilities
3. **Sharpe Ratio** = (Portfolio Return − Risk-free) ÷ Std Dev
4. **Diversification Ratio** = Portfolio Std Dev ÷ Weighted Avg Std Dev
5. **Portfolio Exposure %** = Sector Value ÷ Portfolio Value × 100
6. **Leverage Risk %** = Debt ÷ Asset Value × 100
7. **Sensitivity %** = ΔValue ÷ ΔVariable × 100
8. **Scenario Return** = Σ(Possibility × Return)
9. **Downside Risk** = (Worst Return − Avg Return)
10. **Margin of Safety %** = (Intrinsic Value − Market Value) ÷ Intrinsic Value × 100

**9. Property Management (10 formulas)**

1. **Maintenance Cost %** = Maintenance ÷ Rent × 100
2. **Repair Cost %** = Repairs ÷ NOI × 100
3. **Tenant Turnover Rate %** = Tenants Left ÷ Total Tenants × 100
4. **Eviction Rate %** = Evictions ÷ Tenants × 100
5. **Lease Renewal Rate %** = Renewals ÷ Expiring Leases × 100

**🌾 100 Formulas in Agriculture & Farming**

**1. Crop Yield & Production (15 formulas)**

1. **Crop Yield** = Harvested Output ÷ Cultivated Area
2. **Grain Yield** = (Grain Weight ÷ Area)
3. **Yield per Hectare** = Total Yield ÷ Area (ha)
4. **Harvest Index %** = (Economic Yield ÷ Biological Yield) × 100
5. **Plant Population per Hectare** = (10,000 ÷ Spacing)
6. **Seed Rate (kg/ha)** = (Plant Population × 1000-seed weight) ÷ Germination %
7. **Seed Replacement Rate %** = Certified Seed ÷ Total Seed × 100
8. **Crop Intensity %** = (Gross Cropped Area ÷ Net Sown Area) × 100
9. **Multiple Cropping Index %** = (Total Cropped Area ÷ Net Area) × 100
10. **Land Productivity** = Yield ÷ Area
11. **Yield Gap %** = (Potential Yield − Actual Yield) ÷ Potential Yield × 100
12. **Gross Yield Value** = Yield × Market Price
13. **Net Yield Value** = Gross Yield − Cost of Cultivation
14. **Harvest Efficiency %** = (Collected ÷ Available) × 100
15. **Seed Germination %** = (Seeds Germinated ÷ Seeds Sown) × 100

**2. Soil & Fertility (10 formulas)**

1. **Soil Bulk Density** = Mass of Soil ÷ Volume
2. **Porosity %** = (1 − Bulk Density ÷ Particle Density) × 100
3. **Soil Moisture Content %** = (Wet Soil − Dry Soil) ÷ Dry Soil × 100
4. **Field Capacity %** = (Water Retained ÷ Soil Volume) × 100
5. **Wilting Point %** = (Water Content at Wilting ÷ Volume) × 100
6. **Available Water %** = Field Capacity − Wilting Point
7. **Cation Exchange Capacity (CEC)** = Total Cations ÷ Soil Mass
8. **Soil pH** = −log[H⁺]
9. **Soil Organic Carbon %** = Carbon ÷ Soil Weight × 100
10. **Soil Productivity Index** = Yield ÷ Input

**3. Irrigation & Water (15 formulas)**

1. **Irrigation Requirement (IR)** = ET − Effective Rainfall
2. **Evapotranspiration (ET)** = Kc × ET₀
3. **ET₀ (Penman-Monteith)** = [0.408Δ(Rn−G)+γ(900/(T+273))u₂(es−ea)] ÷ (Δ+γ(1+0.34u₂))
4. **Water Use Efficiency (WUE)** = Yield ÷ Water Used
5. **Irrigation Efficiency %** = (Water Used ÷ Water Applied) × 100
6. **Water Productivity** = Yield ÷ Water Consumed
7. **Duty of Water** = Area ÷ Discharge
8. **Delta (Δ)** = Depth of Water × Duty
9. **Net Irrigation Depth** = (Field Requirement ÷ Efficiency)
10. **Irrigation Frequency** = Net Depth ÷ ET
11. **Irrigation Interval** = Available Moisture ÷ Daily ET
12. **Rainfall Intensity** = Rainfall ÷ Time
13. **Runoff Coefficient (C)** = Runoff ÷ Rainfall
14. **Effective Rainfall** = Total Rainfall − Runoff − Losses
15. **Canal Water Requirement** = Duty × Delta

**4. Fertilizers & Nutrients (15 formulas)**

1. **Fertilizer Requirement (kg)** = Nutrient Required ÷ % Nutrient in Fertilizer × 100
2. **Nutrient Use Efficiency %** = Uptake ÷ Applied × 100
3. **Nitrogen Use Efficiency** = Yield ÷ N Applied
4. **Phosphorus Use Efficiency** = Yield ÷ P Applied
5. **Potassium Use Efficiency** = Yield ÷ K Applied
6. **Fertilizer Application Rate (kg/ha)** = Fertilizer ÷ Area
7. **Nutrient Balance** = Nutrient Added − Nutrient Removed
8. **Fertilizer Cost per ha** = Quantity × Price
9. **Nutrient Uptake** = Nutrient Concentration × Yield
10. **Lime Requirement** = (Desired pH − Current pH) × Buffer Factor
11. **Fertilizer Efficiency %** = Yield Increase ÷ Fertilizer Used × 100
12. **Soil Amendment Rate** = Required Dose ÷ Application Area
13. **Organic Manure Requirement** = Nutrient Need ÷ Nutrient in Manure
14. **Fertilizer Savings %** = (Old Dose − New Dose) ÷ Old Dose × 100
15. **Nutrient Recovery Efficiency %** = (Uptake − Control) ÷ Applied × 100

**5. Livestock & Dairy (10 formulas)**

1. **Feed Conversion Ratio (FCR)** = Feed Intake ÷ Weight Gain
2. **Daily Feed Requirement** = % Body Weight × Weight
3. **Milk Yield Efficiency %** = Milk Yield ÷ Feed Intake × 100
4. **Growth Rate %** = (Final Weight − Initial) ÷ Initial × 100
5. **Calving Interval** = Birth-to-Birth Interval
6. **Egg Production Rate %** = Eggs ÷ Hens × 100
7. **Livestock Productivity Index** = Output ÷ Animal Units
8. **Mortality Rate %** = Deaths ÷ Total Animals × 100
9. **Lactation Yield** = Daily Milk × Lactation Days
10. **Breeding Efficiency %** = Successful Pregnancies ÷ Services × 100

**6. Machinery & Power (10 formulas)**

1. **Field Efficiency %** = Effective ÷ Theoretical × 100
2. **Draft Force** = Soil Resistance × Area of Implement
3. **Power Requirement (kW)** = (Draft × Speed) ÷ 1000
4. **Fuel Consumption** = Liters ÷ Hour
5. **Specific Fuel Consumption** = Fuel ÷ Power Output
6. **Machine Cost/hr** = (Fixed + Operating) ÷ Hours Used
7. **Labor Efficiency %** = Actual Work ÷ Standard Work × 100
8. **Tractor Productivity** = Area Covered ÷ Time
9. **Cost per ha** = Operating Cost ÷ Area
10. **Machine Utilization %** = Working Time ÷ Available Time × 100

**7. Agricultural Economics (10 formulas)**

1. **Gross Return** = Yield × Price
2. **Net Return** = Gross Return − Cost of Cultivation
3. **Benefit-Cost Ratio (BCR)** = Gross Return ÷ Cost
4. **Profitability Index %** = Net Profit ÷ Cost × 100
5. **Break-even Yield** = Total Cost ÷ Price
6. **Break-even Price** = Total Cost ÷ Yield
7. **Farm Business Income** = Gross Income − Operational Costs
8. **Net Farm Income** = Gross Income − (All Costs)
9. **Family Labor Income** = Net Farm Income − Hired Labor
10. **Return on Investment (ROI)** = Net Return ÷ Cost × 100

**8. Storage & Post-Harvest (10 formulas)**

1. **Storage Loss %** = (Initial − Final Quantity) ÷ Initial × 100
2. **Moisture Loss %** = (Initial Moisture − Final) ÷ Initial × 100
3. **Grain Damage %** = Damaged ÷ Total × 100
4. **Shrinkage %** = Weight Loss ÷ Original Weight × 100
5. **Storage Efficiency %** = Stored ÷ Capacity × 100
6. **Shelf Life Index** = Safe Days ÷ Expected Days × 100
7. **Cooling Load** = (Mass × Cp × ΔT) ÷ Time
8. **Refrigeration Efficiency %** = Cooling Effect ÷ Energy × 100
9. **Post-harvest Loss %** = Lost Yield ÷ Harvested × 100
10. **Marketable Surplus %** = (Available − Retained) ÷ Available × 100

**9. Sustainability & Environment (10 formulas)**

1. **Carbon Footprint** = Emission Factor × Inputs
2. **Water Productivity** = Yield ÷ Water Used
3. **Energy Productivity** = Yield ÷ Energy Used
4. **Sustainable Yield Index (SYI)** = (Mean Yield − SD) ÷ Max Yield
5. **Soil Health Index** = (pH + Organic Carbon + Nutrients)/3

**🌍 100 Formulas in Environment & Climate**

**1. Air & Atmosphere (15 formulas)**

1. **Air Quality Index (AQI)** = (Pollutant Concentration ÷ Standard) × 100
2. **Particulate Concentration (PM)** = Mass ÷ Air Volume
3. **Carbon Monoxide Index** = (CO ÷ Standard) × 100
4. **SO₂ Index** = (SO₂ ÷ Standard) × 100
5. **NOx Index** = (NO₂ ÷ Standard) × 100
6. **Ozone Index** = (O₃ ÷ Standard) × 100
7. **Greenhouse Gas Intensity** = Emissions ÷ GDP
8. **Air Density** = P ÷ (RT)
9. **Air Pressure Drop** = ρgh
10. **Mixing Ratio** = Water Vapor ÷ Dry Air Mass
11. **Relative Humidity %** = (Actual Vapor Pressure ÷ Saturation Vapor Pressure) × 100
12. **Dew Point** = T − ((100 − RH)/5)
13. **Visibility Reduction %** = (Scattering ÷ Clear Air) × 100
14. **Smog Index** = (O₃ + NOx) ÷ 2
15. **Pollution Load** = Emission Rate × Time

**2. Climate Change & Carbon (15 formulas)**

1. **Carbon Footprint** = Activity × Emission Factor
2. **CO₂ Equivalent (CO₂e)** = Σ(GHG × GWP)
3. **Carbon Intensity** = CO₂ ÷ Energy Output
4. **Carbon Offset** = Emissions Reduced − Emissions Produced
5. **Carbon Sequestration (Forests)** = Biomass × Carbon Fraction
6. **Carbon Sequestration (Soil)** = Carbon Stock ÷ Area
7. **Per Capita Emission** = Total Emission ÷ Population
8. **Emission Factor** = Emission ÷ Activity
9. **Emission Reduction %** = (Old − New) ÷ Old × 100
10. **Carbon Neutrality %** = (Offset ÷ Emission) × 100
11. **Methane Equivalent (CH₄e)** = CH₄ × 25 (GWP)
12. **Nitrous Oxide Equivalent (N₂Oe)** = N₂O × 298 (GWP)
13. **Carbon Tax Cost** = Emissions × Tax Rate
14. **Carbon Credit Value** = Credits × Market Price
15. **Net Zero Index** = (Removed ÷ Produced) × 100

**3. Water Resources (15 formulas)**

1. **Water Quality Index (WQI)** = Σ(Qi × Wi) ÷ ΣWi
2. **pH** = −log[H⁺]
3. **Dissolved Oxygen %** = Actual DO ÷ Saturation DO × 100
4. **BOD (Biological Oxygen Demand)** = Initial DO − Final DO
5. **COD (Chemical Oxygen Demand)** = Oxygen Used ÷ Volume
6. **Turbidity (NTU)** = Scattered Light ÷ Incident Light
7. **Water Hardness (mg/L)** = Ca²⁺ + Mg²⁺ Equivalent
8. **Nitrate Index** = (NO₃ ÷ Standard) × 100
9. **Fluoride Index** = (F⁻ ÷ Standard) × 100
10. **Safe Water Availability** = Total Water − Polluted Water
11. **Per Capita Water Use** = Water ÷ Population
12. **Water Stress Index** = Demand ÷ Supply
13. **Groundwater Recharge** = Rainfall × Infiltration %
14. **Evapotranspiration (ET)** = Kc × ET₀
15. **Water Use Efficiency** = Yield ÷ Water Consumed

**4. Weather & Climate Science (15 formulas)**

1. **Heat Index (HI)** = T + (0.5555 × (e − 10))
2. **Wind Chill (°C)** = 13.12 + 0.6215T − 11.37V^0.16 + 0.3965TV^0.16
3. **Solar Radiation (Rs)** = (0.25+0.5n/N)Ra
4. **Albedo %** = Reflected ÷ Incoming Radiation × 100
5. **Greenhouse Effect %** = (Trapped Radiation ÷ Incoming) × 100
6. **Precipitation Intensity** = Rainfall ÷ Time
7. **Snow Water Equivalent (SWE)** = Snow Depth × Density ÷ Water Density
8. **Stormwater Runoff** = Rainfall × Catchment × Runoff Coefficient
9. **Flood Frequency** = 1 ÷ Return Period
10. **Heat Wave Index** = Days > Threshold ÷ Total Days × 100
11. **Cyclone Energy Index (ACE)** = Σ(Vmax² × Duration)
12. **Sea Level Rise Rate** = ΔSea Level ÷ Years
13. **Temperature Anomaly** = Actual − Average
14. **Urban Heat Island Intensity** = Urban Temp − Rural Temp
15. **Global Warming Rate** = ΔTemp ÷ Years

**5. Energy & Renewable Sources (15 formulas)**

1. **Solar Panel Power (P)** = Area × Irradiance × Efficiency
2. **Solar Efficiency %** = Output ÷ Input × 100
3. **PV Capacity Factor %** = Actual ÷ Rated Output × 100
4. **Wind Power (P)** = ½ ρAv³
5. **Wind Turbine Efficiency %** = Actual ÷ Betz Limit × 100
6. **Hydropower (P)** = ρgQHη
7. **Biogas Yield** = Waste × Gas Yield Factor
8. **Geothermal Power** = Q × η
9. **Wave Energy** = ½ ρgH²T
10. **Tidal Power** = ½ ρgA²ω²
11. **Energy Payback Ratio** = Lifetime Output ÷ Energy Invested
12. **Levelized Cost of Energy (LCOE)** = Cost ÷ Energy Produced
13. **Renewable Share %** = Renewable ÷ Total Energy × 100
14. **Grid Emission Factor** = Emission ÷ kWh
15. **Energy Saving %** = (Old − New) ÷ Old × 100

**6. Waste Management (10 formulas)**

1. **Waste Generation Rate** = Waste ÷ Population
2. **Per Capita Waste** = Waste ÷ People
3. **Recycling %** = Recycled ÷ Total Waste × 100
4. **Composting %** = Composted ÷ Waste × 100
5. **Landfill %** = Landfilled ÷ Total Waste × 100
6. **Hazardous Waste %** = Hazardous ÷ Total Waste × 100
7. **E-waste Ratio %** = E-waste ÷ Total Waste × 100
8. **Incineration Efficiency %** = Energy Recovered ÷ Waste × 100
9. **Waste Diversion %** = (Recycling + Composting) ÷ Waste × 100
10. **Plastic Waste %** = Plastic ÷ Total Waste × 100

**7. Sustainability & Indices (10 formulas)**

1. **Ecological Footprint** = Land Needed ÷ Land Available
2. **Biocapacity Ratio** = Biocapacity ÷ Footprint
3. **Sustainability Index** = Output ÷ Resource Used
4. **Green Building Index** = Sustainable Materials ÷ Total Materials × 100
5. **Energy Star Rating %** = Standard ÷ Actual Energy × 100
6. **Sustainable Yield Index (SYI)** = (Mean − SD) ÷ Max Yield
7. **Resource Use Efficiency %** = Output ÷ Input × 100
8. **Pollution Intensity** = Emission ÷ Production
9. **Recycling Efficiency %** = Output Recycled ÷ Input × 100
10. **Circular Economy Index** = Recycled ÷ Total Resources × 100

**8. Health & Environment (5 formulas)**

1. **Noise Level (dB)** = 10 log₁₀(I/I₀)
2. **Noise Pollution Index (LNP)** = L10 + (L50−L90)log10(√2)
3. **Radiation Dose (mSv)** = Energy Absorbed ÷ Body Mass
4. **Heat Stress Index** = (T + RH + Work Load) ÷ 3
5. **Environmental Risk %** = Impact ÷ Capacity × 100

**🏅 100 Formulas in Sports & Recreation**

**1. General Sports Performance (15 formulas)**

1. **Speed** = Distance ÷ Time
2. **Pace (Running)** = Time ÷ Distance
3. **Stride Length** = Distance ÷ Steps
4. **Cadence (Running)** = Steps ÷ Minutes
5. **Calories Burned** = MET × Weight × Duration ÷ 60
6. **VO₂ Max (Cooper Test)** = (Distance in m − 504.9) ÷ 44.73
7. **Power Output** = Work ÷ Time
8. **Work** = Force × Distance
9. **Agility Index** = Benchmark ÷ Player Time × 100
10. **Reaction Time Index** = 1 ÷ Response Time
11. **Acceleration** = Δv ÷ Δt
12. **Jump Height** = (t² × g) ÷ 8
13. **Throw Distance** = v² × sin(2θ) ÷ g
14. **Performance Ratio %** = Player Score ÷ Benchmark × 100
15. **Endurance Index** = Distance Covered ÷ Time

**2. Football / Soccer (10 formulas)**

1. **Pass Accuracy %** = Completed Passes ÷ Attempted × 100
2. **Shot Accuracy %** = Shots on Target ÷ Total Shots × 100
3. **Possession %** = Possession Time ÷ Match Time × 100
4. **Goal Conversion %** = Goals ÷ Shots × 100
5. **Save % (Goalkeeper)** = Saves ÷ Shots on Target × 100
6. **Tackle Success %** = Successful Tackles ÷ Attempted × 100
7. **Cross Accuracy %** = Successful Crosses ÷ Total Crosses × 100
8. **Dribble Success %** = Successful Dribbles ÷ Attempted × 100
9. **Distance per Minute** = Distance ÷ Minutes Played
10. **Work Rate Index** = Distance ÷ Possession Time

**3. Basketball (10 formulas)**

1. **Field Goal % (FG%)** = FG Made ÷ FG Attempted × 100
2. **Effective FG% (eFG%)** = (FGM + 0.5×3PM) ÷ FGA × 100
3. **True Shooting % (TS%)** = Points ÷ (2(FGA + 0.44×FTA)) × 100
4. **Free Throw % (FT%)** = FT Made ÷ FTA × 100
5. **Rebound Rate %** = Rebounds ÷ (Team Rebounds + Opponent Rebounds) × 100
6. **Assist-to-Turnover Ratio** = Assists ÷ Turnovers
7. **Player Efficiency Rating (PER)** = (Player Stats ÷ Team Pace)
8. **Usage Rate %** = (FGA+FTA+TO) ÷ Team Possessions × 100
9. **Defensive Rating** = Points Allowed ÷ Possessions × 100
10. **Offensive Rating** = Points Scored ÷ Possessions × 100

**4. Cricket (10 formulas)**

1. **Batting Average** = Runs ÷ Outs
2. **Strike Rate (Batting)** = Runs ÷ Balls × 100
3. **Bowling Average** = Runs Conceded ÷ Wickets Taken
4. **Bowling Economy** = Runs Conceded ÷ Overs Bowled
5. **Bowling Strike Rate** = Balls ÷ Wickets
6. **Fielding Efficiency %** = Successful Catches ÷ Total Chances × 100
7. **Run Rate** = Runs ÷ Overs
8. **Partnership Average** = Runs ÷ Partnerships
9. **Dot Ball %** = Dot Balls ÷ Total Balls × 100
10. **Win Contribution %** = Player Runs ÷ Team Runs × 100

**5. Tennis (10 formulas)**

1. **First Serve %** = First Serves In ÷ Attempts × 100
2. **Aces per Match** = Total Aces ÷ Matches
3. **Double Fault %** = Double Faults ÷ Serves × 100
4. **Break Point Conversion %** = Breaks ÷ Chances × 100
5. **Break Point Saved %** = Breaks Saved ÷ Chances × 100
6. **Winner-to-Error Ratio** = Winners ÷ Errors
7. **Service Game Win %** = Service Games Won ÷ Service Games Played × 100
8. **Return Game Win %** = Return Games Won ÷ Return Games Played × 100
9. **Total Points Won %** = Points Won ÷ Points Played × 100
10. **Tiebreak Efficiency %** = Tiebreaks Won ÷ Tiebreaks Played × 100

**6. Athletics & Running (10 formulas)**

1. **Sprint Speed** = Distance ÷ Time
2. **Marathon Pace** = Time ÷ Distance
3. **Running Economy** = VO₂ ÷ Speed
4. **Stride Frequency** = Steps ÷ Time
5. **Fatigue Index %** = (Best Sprint − Worst Sprint) ÷ Best × 100
6. **VO₂ Max (Running)** = (15 × Max HR ÷ Rest HR)
7. **Heart Rate Reserve (HRR)** = HRmax − HRrest
8. **Training Intensity %** = HR ÷ HRmax × 100
9. **Recovery Ratio %** = Rest HR ÷ Peak HR × 100
10. **Lactate Threshold %** = HR at Threshold ÷ HRmax × 100

**7. Swimming (10 formulas)**

1. **Swim Pace per 100m** = Time ÷ Distance × 100
2. **Stroke Rate** = Strokes ÷ Minute
3. **Stroke Length** = Distance ÷ Strokes
4. **Stroke Efficiency Index (SEI)** = Velocity × Stroke Length
5. **Turn Efficiency %** = Time Saved ÷ Lap Time × 100
6. **Breath Frequency** = Breaths ÷ Lap
7. **Kick Efficiency %** = Kick Distance ÷ Total Distance × 100
8. **Swimming Speed** = Distance ÷ Time
9. **Drag Coefficient** = Force ÷ (½ρv²A)
10. **Energy Cost (Swimming)** = Calories ÷ Distance

**8. Cycling (10 formulas)**

1. **Cycling Speed** = Distance ÷ Time
2. **Cadence (Cycling)** = Pedal Revolutions ÷ Minute
3. **Power (Cycling)** = Torque × Cadence
4. **FTP (Functional Threshold Power)** = Avg Power ÷ 60 min
5. **Calories Burned** = Power × Time × 4.18
6. **Aerodynamic Drag Force** = ½ρCdAv²
7. **Rolling Resistance** = Crr × m × g
8. **Climbing Power** = mgh ÷ t
9. **Efficiency %** = Mechanical Power ÷ Metabolic Power × 100
10. **Gear Ratio** = Teeth (Front) ÷ Teeth (Rear)

**9. Recreational Games (10 formulas)**

1. **Bowling Score (Ten-pin)** = Σ(Pins per Frame + Bonus)
2. **Bowling Strike %** = Strikes ÷ Frames × 100
3. **Bowling Spare %** = Spares ÷ Frames × 100
4. **Golf Handicap** = (Score − Course Rating) × 113 ÷ Slope
5. **Golf Putting Accuracy %** = Putts Made ÷ Attempts × 100
6. **Golf GIR %** = Greens in Regulation ÷ Holes × 100
7. **Chess Performance Rating** = Opp Avg + (800 × (Wins−Losses)/Games)
8. **Table Tennis Rally Efficiency %** = Points Won ÷ Rallies × 100
9. **Badminton Smash Success %** = Smashes Won ÷ Attempts × 100
10. **Volleyball Attack Success %** = Kills ÷ Attempts × 100

**10. Outdoor & Recreation (5 formulas)**

1. **Hiking Pace** = Time ÷ Distance
2. **Climbing Efficiency %** = Elevation Gain ÷ Energy Spent × 100
3. **Fishing Success %** = Fish Caught ÷ Attempts × 100
4. **Archery Accuracy %** = Bullseyes ÷ Arrows × 100
5. **Camping Cost per Day** = Total Cost ÷ Days

**💞 100 Formulas in Human Relationships & Social Life**

**1. Time & Relationship Balance (15 formulas)**

1. **Work-Life Balance %** = Personal Hours ÷ Total Hours × 100
2. **Family Time %** = Family Hours ÷ Free Hours × 100
3. **Friendship Time %** = Time with Friends ÷ Free Hours × 100
4. **Partner Time %** = Couple Hours ÷ Free Hours × 100
5. **Social Media Time %** = Social Media Hours ÷ Free Hours × 100
6. **Relationship Time Index** = Partner Time ÷ (Work + Others) × 100
7. **Weekly Social Engagement %** = Social Hours ÷ Week Hours × 100
8. **Bonding Time %** = Shared Activities ÷ Total Activities × 100
9. **Interaction Ratio** = Positive Interactions ÷ Total Interactions
10. **Conflict Time %** = Conflict Hours ÷ Relationship Hours × 100
11. **Daily Family Presence %** = Days at Home ÷ Total Days × 100
12. **Quality Time %** = Undistracted Hours ÷ Total Hours × 100
13. **Work vs Family Balance Ratio** = Work Hours ÷ Family Hours
14. **Friendship Strength Index** = Meetups ÷ Planned Meetups × 100
15. **Personal Growth vs Social Ratio** = Self-Development Hours ÷ Social Hours

**2. Communication & Interaction (15 formulas)**

1. **Message Response Time** = Time Taken ÷ Messages
2. **Reply Rate %** = Replies ÷ Messages × 100
3. **Communication Efficiency %** = Understood Messages ÷ Sent Messages × 100
4. **Listening Ratio %** = Listening Time ÷ Talking Time × 100
5. **Positive Words %** = Positive Words ÷ Total Words × 100
6. **Argument Ratio %** = Arguments ÷ Conversations × 100
7. **Conflict Resolution %** = Resolved Issues ÷ Total Issues × 100
8. **Miscommunication %** = Misunderstandings ÷ Conversations × 100
9. **Trust Communication Index** = Honest Conversations ÷ Total Conversations × 100
10. **Daily Check-in %** = Check-ins ÷ Days × 100
11. **Online-to-Offline Ratio** = Online Chats ÷ In-person Meetings
12. **Message Consistency %** = Daily Messages ÷ Average Messages × 100
13. **Empathy Index** = Supportive Responses ÷ Requests × 100
14. **Talk Time Balance %** = Person A Talk ÷ Person B Talk × 100
15. **Follow-up Rate %** = Follow-ups ÷ Promises × 100

**3. Emotional & Social Well-being (15 formulas)**

1. **Happiness Index** = Happy Days ÷ Total Days × 100
2. **Stress-free Days %** = Stress-free Days ÷ Total Days × 100
3. **Mood Balance %** = Positive Mood ÷ Total Moods × 100
4. **Relationship Satisfaction %** = Positive Ratings ÷ Total Ratings × 100
5. **Trust Level %** = Trustful Acts ÷ Total Acts × 100
6. **Emotional Support Index** = Support Hours ÷ Needed Hours × 100
7. **Conflict-Free Days %** = Conflict-Free ÷ Total Days × 100
8. **Apology Ratio %** = Apologies ÷ Conflicts × 100
9. **Forgiveness Index %** = Forgiven Acts ÷ Total Acts × 100
10. **Love Language Balance %** = Acts Given ÷ Acts Needed × 100
11. **Compliment Ratio %** = Compliments ÷ Conversations × 100
12. **Affection %** = Affectionate Acts ÷ Total Acts × 100
13. **Trust Breach %** = Broken Promises ÷ Total Promises × 100
14. **Support Availability %** = Times Available ÷ Times Needed × 100
15. **Positivity Index** = Positive Experiences ÷ Total Experiences × 100

**4. Dating & Romantic Relationships (10 formulas)**

1. **Date Frequency %** = Dates ÷ Weeks × 100
2. **Date Success %** = Enjoyable Dates ÷ Total Dates × 100
3. **Gift Frequency** = Gifts ÷ Months
4. **Anniversary Commitment %** = Celebrated Anniversaries ÷ Total Anniversaries × 100
5. **Romantic Gesture Index** = Gestures ÷ Relationship Months
6. **Love Consistency %** = Positive Acts ÷ Months Together × 100
7. **Breakup Risk %** = (Conflicts ÷ Quality Time) × 100
8. **Reunion Rate %** = Reconciled ÷ Breakups × 100
9. **Trust Recovery %** = Trust Restored ÷ Trust Lost × 100
10. **Relationship Growth %** = New Milestones ÷ Total Months × 100

**5. Friendships & Networking (10 formulas)**

1. **Friendship Engagement %** = Calls + Meets ÷ Planned × 100
2. **Friendship Longevity %** = Years Together ÷ Total Years × 100
3. **Friendship Reciprocity %** = Help Given ÷ Help Received × 100
4. **Group Activity Participation %** = Attended ÷ Invited × 100
5. **Social Reach** = Friends ÷ Average Network Size
6. **Supportive Friendship %** = Supportive Friends ÷ Total Friends × 100
7. **Networking Growth %** = New Contacts ÷ Old Contacts × 100
8. **Event Attendance %** = Events Attended ÷ Events Invited × 100
9. **Friendship Effort Ratio** = Initiations ÷ Responses
10. **Shared Interest Index %** = Shared Hobbies ÷ Total Hobbies × 100

**6. Family & Parenting (10 formulas)**

1. **Family Support Index %** = Support Acts ÷ Needs × 100
2. **Parent Involvement %** = Parent Time ÷ Child Time × 100
3. **Homework Help %** = Assisted ÷ Homework Sessions × 100
4. **Meal Together %** = Meals Together ÷ Total Meals × 100
5. **Family Communication %** = Family Calls ÷ Total Calls × 100
6. **Household Chore Sharing %** = Chores Done ÷ Total Chores × 100
7. **Family Harmony Index** = Positive Interactions ÷ Total Interactions × 100
8. **Sibling Bond Index** = Shared Activities ÷ Planned × 100
9. **Generational Support %** = Support to Parents ÷ Needs × 100
10. **Parenting Balance %** = Mother Time ÷ Father Time × 100

**7. Events & Social Activities (10 formulas)**

1. **Event Attendance %** = Attendees ÷ Invited × 100
2. **Cost per Person** = Total Cost ÷ Guests
3. **Catering Efficiency %** = Food Consumed ÷ Food Ordered × 100
4. **Event Success %** = Positive Feedback ÷ Total Feedback × 100
5. **Guest Satisfaction %** = Happy Guests ÷ Total Guests × 100
6. **Event Planning Accuracy %** = Planned vs Actual Tasks × 100
7. **Budget Deviation %** = (Actual − Budget) ÷ Budget × 100
8. **Participation Rate %** = Participants ÷ Invited × 100
9. **Volunteer Contribution %** = Volunteer Hours ÷ Total Hours × 100
10. **Entertainment Success %** = Enjoyed ÷ Total Guests × 100

**8. Community & Society (10 formulas)**

1. **Community Participation %** = Activities ÷ Opportunities × 100
2. **Charity Contribution %** = Donation ÷ Income × 100
3. **Volunteer Rate %** = Volunteers ÷ Population × 100
4. **Civic Engagement %** = Civic Acts ÷ Total Acts × 100
5. **Community Happiness Index** = Positive Acts ÷ Total Acts × 100
6. **Cultural Event Attendance %** = Attendance ÷ Invitations × 100
7. **Religious Participation %** = Attended ÷ Events × 100
8. **Neighborhood Support %** = Helped ÷ Requests × 100
9. **Social Trust Index** = Trustful Interactions ÷ Total × 100
10. **Community Impact %** = Beneficiaries ÷ Population × 100

**9. Digital & Online Social Life (10 formulas)**

1. **Follower Growth %** = (New Followers ÷ Old Followers) × 100
2. **Engagement Rate %** = Interactions ÷ Followers × 100
3. **Like Ratio %** = Likes ÷ Views × 100
4. **Comment Ratio %** = Comments ÷ Posts × 100
5. **Social Media Balance %** = Social Media Time ÷ Free Time × 100