

2027 CFA Level I - Formula sheet

CORE EDITION / 30 formulas with original worked examples

The printable companion to quizara.com/cfa-level-1/formula-sheet, where you can change each example's inputs. This core edition covers frequently used formulas; it is not yet a complete list of every Level I formula.

All explanations and example numbers were written for Quizara. Percentage inputs are shown as percentages; convert them to decimals where an equation requires it. Calculator steps use the printed example values.

Ethical and Professional Standards

Ethics is a judgment subject. Identify the relevant standard, the material facts, and the appropriate action; this edition does not invent an Ethics equation.

2027 scope: The Ethics update incorporates the twelfth edition of the Standards of Practice Handbook, with separate modules for the Standards. See the official curriculum update linked at the end.

Quantitative Methods

Future value of a lump sum

$$FV = PV \times (1 + r)^n$$

Move a single amount forward through time. Each year's interest becomes part of the next year's starting amount.

Assumptions: Annual compounding, a constant annual rate, and no additional deposits. Enter 6 for 6% in the example fields.

Example inputs: Amount today = 1000 \$; Annual interest rate = 6 %; Years = 5 years

Future value: \$1,338.23

1. Clear TVM with [2nd] [CLR TVM]. Set P/Y = 1 and C/Y = 1, then return to standard mode. Use END mode.
2. 5 [N] / 6 [I/Y] / 1000 [+/-] [PV] / 0 [PMT]
3. [CPT] [FV] -> 1,338.23. PV is negative because it is the initial cash outflow.

2027 scope: Quantitative Methods has a stronger applied focus, including interactive time-value-of-money lessons. This equation is not being labelled new.

Present value of a lump sum

$$PV = FV / (1 + r)^n$$

Translate a future amount into today's money using a discount rate.

Assumptions: A single future payment and annual compounding. The result is the positive value today.

Example inputs: Future amount = 1000 \$; Annual discount rate = 6 %; Years = 5 years

Present value: \$747.26

1. Clear TVM with [2nd] [CLR TVM]. Set P/Y = 1 and C/Y = 1, then return to standard mode. Use END mode.
2. 5 [N] / 6 [I/Y] / 0 [PMT] / 1000 [FV]
3. [CPT] [PV] -> -747.26. Its magnitude, 747.26, is the value today.

Compound annual growth rate

$$g = (\text{ending value} / \text{beginning value})^{(1/n)} - 1$$

Find the constant yearly rate that connects a beginning value to an ending value.

Assumptions: Positive starting and ending values; no intermediate cash flows. This is not the arithmetic mean of annual returns.

Example inputs: Beginning value = 100 \$; Ending value = 125 \$; Years = 3 years

Annualized growth: 7.72%

1. 125 [/] 100 [=]
2. [yx] [(] 1 [/] 3 [)] [=]
3. [-] 1 [=] [x] 100 [=] -> 7.72%.

Effective annual rate

$$EAR = (1 + \text{stated annual rate} / m)^m - 1$$

Include compounding within the year when comparing stated annual interest rates.

Assumptions: The stated rate is nominal. Compounding periods must be a positive whole number.

Example inputs: Stated annual rate = 8 %; Compounds per year = 4 periods

Effective annual rate: 8.24%

1. 8 [/] 100 [/] 4 [=] [+] 1 [=]
2. [yx] 4 [=] [-] 1 [=]
3. [x] 100 [=] -> 8.24%.

Two-period geometric mean return

$$\text{geometric return} = \sqrt{(1 + R1)(1 + R2)} - 1$$

Measure the constant per-period return with the same compounded outcome as two actual returns.

Assumptions: Equal-length periods, no external cash flows, and each return greater than -100%.

Example inputs: First-period return = 20 %; Second-period return = -20 %

Geometric mean: -2.02%

1. 1.20 [x] 0.80 [=]
2. [2nd] [sqrtx] [-] 1 [=]
3. [x] 100 [=] -> -2.02% per period.

Two-period arithmetic mean return

$$\text{arithmetic return} = (R1 + R2) / 2$$

Average the returns observed in two equally weighted periods.

Assumptions: This average does not describe the compound growth of an investment.

Example inputs: First-period return = 10 %; Second-period return = -4 %

Arithmetic mean: 3.00%

1. 10 [-] 4 [=]
2. [/] 2 [=] -> 3.00%.

Economics

Own-price elasticity of demand

$$\text{elasticity} = \text{percentage change in quantity} / \text{percentage change in price}$$

Compare how strongly quantity demanded responds to a change in the good's own price.

Assumptions: Use compatible percentage-change conventions. This example supplies the changes directly and holds other demand factors constant.

Example inputs: Quantity change = -12 %; Price change = 8 %

Signed elasticity: -1.50

1. 12 [+/-] [/] 8 [=] -> -1.50.
2. Use the magnitude, 1.50, when classifying demand as elastic.

GDP by expenditure

$$\text{GDP} = C + I + G + X - M$$

Add final spending on domestic production, including net exports.

Assumptions: All components cover the same period and currency units. Investment includes gross capital formation.

Example inputs: Consumption = 600 bn; Investment = 150 bn; Government spending = 200 bn; Exports = 120 bn; Imports = 90 bn

GDP: 980.00 bn

1. 600 [+] 150 [+] 200 [+] 120 [-] 90 [=] -> 980 billion.

Financial Statement Analysis

Current ratio

$$\text{current ratio} = \text{current assets} / \text{current liabilities}$$

Compare near-term assets with near-term obligations at a balance-sheet date.

Assumptions: Use matching dates and units. A high ratio alone does not establish the quality or liquidity of the assets.

Example inputs: Current assets = 150 \$m; Current liabilities = 100 \$m

Current ratio: 1.50 x

1. $150 / 100 [=]$ -> 1.50 times.

Return on equity

$$\text{ROE} = \text{net income} / \text{average equity}$$

Relate a period's earnings to the equity supporting those earnings.

Assumptions: This example uses total net income and average total shareholders' equity consistently. Negative equity makes the conventional ratio difficult to interpret.

Example inputs: Net income = 20 \$m; Average equity = 100 \$m

ROE: 20.00%

1. $20 / 100 [=] [x] 100 [=]$ -> 20.00%.

Three-part DuPont analysis

$$\text{ROE} = \text{net profit margin} \times \text{asset turnover} \times \text{equity multiplier}$$

Separate profitability, asset efficiency, and financial leverage to explain ROE.

Assumptions: Use consistent income, sales, average assets, and average equity across the three ratios.

Example inputs: Net profit margin = 8 %; Asset turnover = 1.5 x; Equity multiplier = 2 x

ROE: 24.00%

1. $8 / 100 [x] 1.5 [x] 2 [=]$

2. $[x] 100 [=]$ -> 24.00%.

Days of inventory on hand

$$\text{DOH} = \text{average inventory} / \text{annual cost of goods sold} \times 365$$

Express the inventory balance as the number of days of annual cost of goods sold it represents.

Assumptions: A 365-day year, annual COGS, and average inventory. Use a different day count if a question specifies one.

Example inputs: Average inventory = 50 \$m; Annual cost of goods sold = 250 \$m

Inventory days: 73.00 days

1. $50 / 250 [x] 365 [=]$ -> 73 days.

Corporate Finance

Net present value: two annual cash flows

$$NPV = -\text{initial outlay} + C1/(1+r) + C2/(1+r)^2$$

Subtract the investment outlay from the present value of its expected cash inflows.

Assumptions: The initial outlay is entered as a positive amount; C1 and C2 arrive at each year-end. Use a discount rate appropriate to the cash flows.

Example inputs: Initial outlay = 1000 \$; Year 1 cash flow = 600 \$; Year 2 cash flow = 600 \$; Annual discount rate = 10 %

NPV: \$41.32

1. [CF] [2nd] [CLR WORK]; enter CF0 = -1000, C01 = 600, F01 = 1, C02 = 600, F02 = 1, pressing [ENTER] to store each value and [down] to move.

2. [NPV]; enter I = 10 [ENTER]; [down] to NPV, then [CPT] -> 41.32.

Weighted average cost of capital

$$WACC = \text{equity weight} \times \text{cost of equity} + \text{debt weight} \times \text{cost of debt} \times (1 - \text{tax rate})$$

Combine the required returns on debt and equity, allowing for the debt interest tax shield.

Assumptions: Debt and equity only; market-value weights total 100%. Interest is fully tax-deductible at the stated tax rate.

Example inputs: Equity weight = 60 %; Cost of equity = 10 %; Pre-tax cost of debt = 5 %; Tax rate = 25 %

WACC: 7.50%

1. 0.6 [x] 0.10 [=] [STO] 1

2. 0.4 [x] 0.05 [x] 0.75 [=] [+] [RCL] 1 [=]

3. [x] 100 [=] -> 7.50%.

Equities

Gordon growth valuation

$$V0 = \text{next dividend} / (\text{required return} - \text{perpetual growth})$$

Value a stream of dividends growing at a constant rate indefinitely.

Assumptions: D1 is next period's dividend, not the dividend just paid. The required return must exceed perpetual growth.

Example inputs: Next dividend = 3 \$; Required return = 9 %; Perpetual dividend growth = 3 %

Value per share: \$50.00

1. 0.09 [-] 0.03 [=] [STO] 1

2. 3 [/] [RCL] 1 [=] -> 50.00.

CAPM required return

$$\text{cost of equity} = \text{risk-free rate} + \text{beta} \times \text{equity risk premium}$$

Estimate a required return using exposure to market risk.

Assumptions: The equity risk premium is the expected market return minus the risk-free rate. It is not the market return itself.

Example inputs: Risk-free rate = 3 %; Equity beta = 1.2; Equity risk premium = 5 %

Required return: 9.00%

1. $1.2 \times 5 \div 100 + 3 = 9.00\%$

2027 scope: Equities expands practical cost-of-equity estimation using market data. CAPM itself is not a new equation.

Price-to-earnings ratio

$$\text{P/E} = \text{price per share} / \text{earnings per share}$$

Express the share price as a multiple of earnings attributable to one share.

Assumptions: State whether EPS is trailing or forward. This example uses positive trailing EPS.

Example inputs: Price per share = 60 \$; Trailing earnings per share = 4 \$

Trailing P/E: 15.00 x

1. $60 \div 4 = 15.00$ times.

Probability-weighted scenario value

$$\text{expected value} = \text{sum of each scenario probability} \times \text{its value}$$

Combine downside, base, and upside valuation scenarios instead of relying on one outcome.

Assumptions: Values are measured at the same date. The three scenario probabilities are non-negative and sum to 100%.

Example inputs: Downside value = 60 \$; Base value = 80 \$; Upside value = 110 \$; Downside probability = 30 %; Base probability = 40 %

Weighted value: \$83.00

1. $60 \times 0.3 \div 100 + 80 \times 0.4 \div 100 + 110 \times 0.3 \div 100 = 83.00$

2. $110 \times 0.3 \div 100 + 80 \times 0.4 \div 100 + 60 \times 0.3 \div 100 = 83.00$

2027 scope: Probability-weighted scenarios are introduced as standard valuation practice in Equities. This is a coverage change, not a newly invented formula.

Fixed Income

Zero-coupon bond price

$$\text{price} = \text{maturity value} / (1 + \text{annual yield})^{\text{years}}$$

Discount the only cash flow of a zero-coupon bond: its payment at maturity.

Assumptions: Annual effective yield, no interim coupons, and the stated maturity payment is received.

Example inputs: Maturity value = 1000 \$; Annual effective yield = 5 %; Years to maturity = 3 years

Bond price: \$863.84

1. Clear TVM with [2nd] [CLR TVM]. Set P/Y = 1 and C/Y = 1, then return to standard mode. Use END mode.

2. 3 [N] / 5 [I/Y] / 0 [PMT] / 1000 [FV]

3. [CPT] [PV] -> -863.84. Quote the positive price, 863.84.

Modified duration

$$\text{modified duration} = \text{Macaulay duration} / (1 + \text{yield} / \text{frequency})$$

Translate cash-flow timing into first-order sensitivity to a change in yield.

Assumptions: Macaulay duration is in years; y is nominal annual yield compounded m times. Use the same yield convention throughout.

Example inputs: Macaulay duration = 5 years; Nominal annual yield = 6 %; Compounds per year = 2 periods

Modified duration: 4.8544 years

1. 0.06 [/] 2 [=] [+] 1 [=] [STO] 1

2. 5 [/] [RCL] 1 [=] -> 4.8544 years.

Duration-only price change

$$\text{approximate price change} = -\text{modified duration} \times \text{change in yield}$$

Approximate a bond's percentage price move for a small yield change.

Assumptions: Ignores convexity and assumes unchanged cash flows. One basis point is 0.0001 in decimal yield.

Example inputs: Modified duration = 4.8 years; Yield change = 50 bp

Approximate price change: -2.40%

1. 50 [/] 10000 [=] [x] 4.8 [=] [+/-]

2. [x] 100 [=] -> -2.40%.

Current yield

$$\text{current yield} = \text{annual coupon} / \text{bond price}$$

Compare annual coupon income with the amount paid for the bond.

Assumptions: Price and coupon refer to the same face amount. This omits reinvestment and any gain or loss at maturity.

Example inputs: Annual coupon = 40 \$; Bond price = 950 \$

Current yield: 4.21%

1. 40 [/] 950 [=] [x] 100 [=] -> 4.21%.

Derivatives and Risk Management

Forward price with no income

$$\text{forward price} = \text{spot price} \times (1 + \text{annual risk-free rate})^T$$

Grow the spot price by the financing cost to obtain the no-arbitrage delivery price.

Assumptions: Annual effective compounding, no income or storage cost, and frictionless borrowing and lending at the same rate.

Example inputs: Spot price = 100 \$; Annual risk-free rate = 4 %; Years to delivery = 1 years

Forward price: \$104.00

1. $1.04^{[yx]} 1 [=] [x] 100 [=] \rightarrow 104.00$.

Long call payoff at expiration

$$\text{call payoff} = \max(\text{terminal asset price} - \text{strike}, 0)$$

A call holder uses the right to buy only when the asset is worth more than the strike.

Assumptions: Payoff per unit of underlying at expiration. Subtract the premium separately to find profit.

Example inputs: Asset price at expiration = 115 \$; Strike price = 100 \$

Call payoff: \$15.00

1. $115 [-] 100 [=] \rightarrow 15.00$.

2. If the result is negative, the payoff is zero. No premium is deducted here.

Long put payoff at expiration

$$\text{put payoff} = \max(\text{strike} - \text{terminal asset price}, 0)$$

A put holder uses the right to sell only when the strike exceeds the asset's market price.

Assumptions: Payoff per unit of underlying at expiration. This is before the option premium.

Example inputs: Asset price at expiration = 85 \$; Strike price = 100 \$

Put payoff: \$15.00

1. $100 [-] 85 [=] \rightarrow 15.00$.

2. If the result is negative, the payoff is zero.

Alternative Investments

Direct capitalization of property income

$$\text{property value} = \text{next-year net operating income} / \text{capitalization rate}$$

Turn one year's stabilized property income into an estimated property value.

Assumptions: Use forward stabilized NOI before financing and income taxes, paired with a comparable capitalization rate.

Example inputs: Next-year net operating income = 60000 \$; Capitalization rate = 6 %

Estimated property value: \$1,000,000.00

1. $60000 [/] 0.06 [=] \rightarrow 1,000,000.00$.

One-period leveraged equity return

$$\text{equity return} = \text{asset return} + \text{debt/equity} \times (\text{asset return} - \text{borrowing rate})$$

Measure how borrowed funds amplify the spread between asset performance and financing cost.

Assumptions: One period; fixed beginning debt, no taxes, fees, or interim cash flows. Losses can also be amplified.

Example inputs: Asset return = 8 %; Borrowing rate = 5 %; Beginning debt-to-equity = 1 x

Equity return: 11.00%

1. 8 [-] 5 [=] [x] 1 [=] [+] 8 [=] -> 11.00%.

Portfolio Construction

Two-asset expected return

$$\text{portfolio expected return} = \text{weight A} \times \text{return A} + \text{weight B} \times \text{return B}$$

Average expected returns using the share of capital allocated to each asset.

Assumptions: A fully invested, long-only two-asset portfolio. Weights refer to the start of the return period.

Example inputs: Weight in asset A = 60 %; Expected return A = 8 %; Expected return B = 3 %

Expected portfolio return: 6.00%

1. 0.6 [x] 8 [=] [STO] 1

2. 0.4 [x] 3 [=] [+] [RCL] 1 [=] -> 6.00%.

Two-asset portfolio standard deviation

$$SD = \sqrt{w^2 SD_A^2 + (1-w)^2 SD_B^2 + 2w(1-w) SD_A SD_B \text{ correlation}}$$

Include both individual volatility and how the two assets move together.

Assumptions: Long-only weights sum to 100%; both standard deviations use the same time horizon; correlation lies between -1 and 1.

Example inputs: Weight in asset A = 60 %; Standard deviation A = 15 %; Standard deviation B = 8 %; Correlation = 0.2

Portfolio standard deviation: 10.14%

1. 0.6 [x] 15 [=] [STO] 1; 0.4 [x] 8 [=] [STO] 2

2. 2 [x] [RCL] 1 [x] [RCL] 2 [x] 0.2 [=] [STO] 3

3. [RCL] 1 [x^2] [+] [()] [RCL] 2 [x^2] [)] [+] [RCL] 3 [=] [2nd] [sqrtx] -> 10.14%.

Sharpe ratio

$$\text{Sharpe ratio} = (\text{portfolio return} - \text{risk-free rate}) / \text{portfolio standard deviation}$$

Measure excess return relative to total return variability.

Assumptions: Return, risk-free rate, and volatility use the same time horizon and compatible annualization. Positive standard deviation is required.

Example inputs: Portfolio return = 10 %; Risk-free rate = 3 %; Portfolio standard deviation = 14 %

Sharpe ratio: 0.50

1. 10 [-] 3 [=] [/] 14 [=] -> 0.50.

Sources and edition notes

2027 scope notes identify documented curriculum coverage changes. They do not assert that an equation is new or changed. A formula-by-formula comparison with the 2026 curriculum is not part of this edition.

CFA Institute: 2027 curriculum update

Texas Instruments: BA II Plus TVM key reference

Study these formulas in context

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