Compound Annual Growth Rate (CAGR)

Compound annual growth rate between a starting and ending value over a number of years, with total growth, doubling time and a projection forward.

Method: Compound growth

Input parameters

Unit system: SI

Parameter	Value	Unit
Starting value	1,200.0	
Ending value	2,100.0	
Years between them	6.0000	
Years to project beyond the end	4.0000	

Calculated results

Parameter	Value	Unit
Compound annual growth rate	9.7757	%
Total growth over the period	75.000	%
Doubling (or halving) time in years	7.4317	
Projected value	3,049.6	

Notes for this case

• CAGR is the constant yearly rate that takes V_0 to V_1 in n years: g = (V_1/V_0)^(1/n) − 1. It smooths out the path between the two end points, so two very different histories can share one CAGR. The doubling time is ln 2/ln(1 + g), close to the rule of 70 (70/ percentage rate) for small rates. The projection assumes the same rate continues.

Formula and method

$$g = \left(\frac{V_1}{V_0}\right)^{1/n} - 1, \quad t_2 = \frac{\ln 2}{\ln(1+g)}$$

Variables

V_0	Starting value	-
V_1	Ending value	-
n	Years between them	-
t	Years to project beyond the end	-
g	Compound annual growth rate	-
G	Total growth over the period	-
t_2	Doubling (or halving) time in years	-
$V(t)$	Projected value	-

Method and standards

CAGR.

Assumptions and limits

- Constant compound rate between the end points.

References

Compound growth

Report details

Report reference	FCC-A75V-YCHA (the same inputs always give the same reference)
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Calculator	Compound Annual Growth Rate (CAGR)
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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/general/economics/cagr-growth-rate

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.