Discounted Payback Period with Escalating Savings

Years until discounted savings repay an investment, with savings that escalate each year, against the simple payback.

Method: Discounted payback: first year where cumulative discounted savings equal the investment

Input parameters

Unit system: SI

Parameter	Value	Unit
Investment	1,200,000	
Saving in year 1	420,000	
Saving escalation per year	5.0000	%
Discount rate	12.000	%

Calculated results

Parameter	Value	Unit
Discounted payback (years)	3.4655	
Simple payback (years)	2.8571	

Notes for this case

- End-of-year savings, interpolated within the final year.

Formula and method

$$\sum_{k=1}^{t} \frac{S_1(1+e)^{k-1}}{(1+d)^k} = I$$

Variables

I	Investment	-
S_1	Saving in year 1	-
e	Saving escalation per year	-
d	Discount rate	-
t_{dpb}	Discounted payback (years)	-
t_{pb}	Simple payback (years)	-

Method and standards

Cumulative present value.

Assumptions and limits

- End-of-year flows.

References

- Discounted payback: first year where cumulative discounted savings equal the investment

Report details

Report reference	FCC-9QW9-SMAK (the same inputs always give the same reference)
Generated	17 November 2026, 19:48 UTC
Calculator	Discounted Payback Period with Escalating Savings
Method last reviewed	12 November 2026
Software release	FireCAD Calc, release of 17 November 2026
Release checks	2 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/discounted-payback

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.