Percentage Change, Difference and Error Calculator

Percentage change from an old to a new value, percentage error of a measured value against the true value, and the percentage difference between two values.

Method: Definitions of relative change and relative error

Input parameters

Unit system: SI

Parameter	Value	Unit
Old, reference or true value	80.000	
New or measured value	86.000	

Calculated results

Parameter	Value	Unit
Change $V_2 - V_1$	6.0000	
Percentage change $(V_2 - V_1) / \lvert V_1 \rvert$	7.5000	%
Percentage error $\lvert V_2 - V_1 \rvert / \lvert V_1 \rvert$	7.5000	%
Percentage difference $\lvert V_2 - V_1 \rvert$ / mean	7.2289	%
Ratio	1.0750	

Notes for this case

- Percentage points are not percentages: a rise in efficiency from 80 % to 86 % is 6 points, or 7.5 %.

Formula and method

$$\delta = \frac{V_2 - V_1}{|V_1|}, \quad \delta_{abs} = \frac{|V_2 - V_1|}{|V_1|}, \quad \delta_m = \frac{|V_2 - V_1|}{(|V_1| + |V_2|)/2}$$

Variables

V_1	Old, reference or true value	-
V_2	New or measured value	-
ΔV	Change $V_2 - V_1$	-
δ	Percentage change $(V_2 - V_1)$ /	V_1
δ_{abs}	Percentage error	$V_2 - V_1$
δ_m	Percentage difference	$V_2 - V_1$
V_2/V_1	Ratio	-

Method and standards

Standard definitions.

Assumptions and limits

- Reference value not zero.

References

- Definitions of relative change and relative error

Report details

Report reference	FCC-4J33-3Y4B (the same inputs always give the same reference)
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Calculator	Percentage Change, Difference and Error Calculator
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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/geometry/percentage-change-error

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.