PERCENTAGES · PART 4 OF 8 · AGES 11–16

Percentage Change Rules

How to measure a change as a percentage, and how to work backwards to the value before the change.

Percentage change

`change ÷ original × 100`

The rule
Divide the change by the original value, the one before the change, then multiply by 100.

`12 ÷ 80 × 100 = 15% increase`

Percentage increase
A price rises from 80 to 92. The change is 92 − 80 = 12, and the original is 80.

`60 ÷ 250 × 100 = 24% decrease`

Percentage decrease
A bus fleet shrinks from 250 to 190 buses. The change is 250 − 190 = 60, and the original is 250.

`92 ÷ 80 = 1.15, so up 15%`

Multiplier shortcut
Divide the new value by the original. Above 1 is a rise and below 1 is a fall.

`10 ÷ 40 × 100 = 25% profit`

Percentage profit
Use the cost price as the original. Buy something for 40 and sell it for 50: the profit is 10.

Reverse percentages

`original = new value ÷ multiplier`

Find the original
Write the new value as a percentage of the original, turn that into a multiplier, then divide by it.

`63 ÷ 0.7 = 90`

After a decrease
After 30% off, a jacket costs 63. That is 100% − 30% = 70% of the original price.

`1,500 ÷ 1.25 = 1,200`

After an increase
After a 25% pay rise, a wage is 1,500 a month. That is 100% + 25% = 125% of the old wage.

`90 × 0.7 = 63 and 1,200 × 1.25 = 1,500`

Check forwards
Multiply your answer by the multiplier. You should get back the value you were given.

Divide by the original

In a percentage change the original value always goes on the bottom. In a reverse percentage the original is the unknown, so you divide by the multiplier instead.

NEXT IN THE SERIES
5. Percentage vs Percentage Points: What Is the Difference?

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