Weightings and Rates

Weighted Means

Weighted mean $\bar{x} = \sum wx / \sum w$

Exam Paper 1 weight 40

Exam Paper 2 weight 30

Project weight 20

Practical weight 10

Actual 62% / 38% / 58% / 39%

weighted mark =

62×0.4+38×0.3+58%×0.2+39%×0.1

= 51.7%

Weighted Index Numbers

Weighted index number

= current weighted mean price ÷

base year weighted mean price×100

So a question might give you a shopping basket price plus weightings at base year plus some later year and ask you to calculate the new index.

Chain Base Index Numbers

Compare prices from each year with the previous year

So 2013 2014 2015 2016.

Index 60 62 63 67

Chain base numbers are

1.033 1.016 1.063

Now from 60 to 67 is 1.117 which is of course the three chain base numbers multiplied together.

Averaging Percentages

Average of 5%, 6% and 7%

$= \sqrt[3]{(1.05 \times 1.06 \times 1.07)} = 1.05997$

The difference for short runs are minimal but note slightly less than the arithmetic mean.

Rates of Change

Crude <birth> rate is number of births per 1000 of population.

Crude rate =

No.<births>/total population×1000.

Standard population =

No .in age group / total pop. × 1000

Standardised Rate

Standardised Rate =

crude rate / 1000 × standard pop.

So if there is an age group of 2647 in a population of 43595 and suffers 57 deaths the standardised death rate is

(57 / 43595) × 1000 × 2647 / 43595

= 0.0794

Note 43595 is used twice.

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