

Chain Index from one to next to next

## Index and Chain Index

Base Index from base to next next

**Q1** The table below shows the crop area for wheat, in hectares, in Northern Ireland from 2016 to 2020 in June each year.

The associated chain base index numbers are shown.

The base year is 2015

Year	2016	2017	2018	2019	2020
Crop area for wheat	8616	8730	6845	8104	7132
Chain base index number	108.0	101.3	78.4	118.4	

(a) Calculate the crop area in hectares for wheat in Northern Ireland in 2015

Show your working and give your answer to the nearest whole number.

$$2015 \xleftarrow{\div 1.08} 2016$$

8616 hectares

$$\xrightarrow{\times 1.08}$$

Answer 7978 hectares [3]

(b) Calculate the chain base index number for the crop area for wheat in Northern Ireland in 2020

Show your working.

Chain Index from one value to the next

$$2019 \xrightarrow{\times 0.88} 2020$$

8104      7132

Answer 88.0 [2]

(c) Give an interpretation of your answer to part (b).

The crop area for wheat in Northern Ireland decreased by 12% between 2019 and 2020

[3]

The table gives the chain base index number for the average price of houses in the United Kingdom in January for each of the years 2016 to 2019

Q2

Year	January 2015	January 2016	January 2017	January 2018	January 2019
Chain base index numbers		107.76	104.76	104.32	101.73

(Source: *landregistry.data.gov.uk*)

- (a) Describe what the chain base index numbers show about the average price of houses in January for the years 2016 to 2019

Every year the average price of house increases. This is because they are all 100 + This increase starts from 2015 to 2016 with 7.76% price increase.

In January 2017, the average price of houses in the United Kingdom was £215 243

- (b) Calculate the average price of houses in the United Kingdom in January 2016  
Give your answer correct to the nearest £

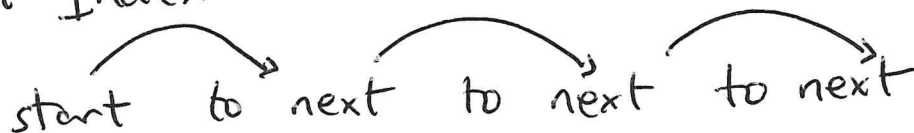
$$\begin{array}{ccc}
 2016 & & 2017 \\
 & \swarrow & \\
 & \div 1.0476 & \\
 205462 & & 215243
 \end{array}$$

$$\begin{array}{ccc}
 & & \nearrow \\
 & & \times 1.0476
 \end{array}$$

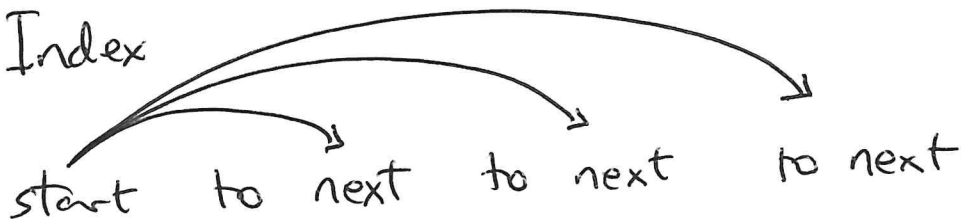
£205462

(2)

Chain Index



Base Index



### Q3

Changes in the cost of living in the United Kingdom are measured by the consumer price index (CPI).

The table shows the index numbers for June 2019, using 2015 as base year, of the items that contribute to the CPI.

The table also shows the weightings for how the spending by the Jones family is divided between these items.

Item	Index number	Jones family weighting	weighted index number
Food, alcohol and tobacco	106.4	17	18.086
Clothing and footwear	102.0	8	8.16
Housing and services	107.5	32	34.4
Transport	112.5	6	6.75
Communication, recreation and leisure	108.9	25	27.225
Health, education and miscellaneous	106.6	12	12.792

(Source: Office for National Statistics)

Using 2015 as base year, the CPI for June 2019 was 107.9

Compare the overall change in the cost of living for the Jones family between 2015 and June 2019 with the change in the CPI between 2015 and June 2019

Explain whether or not it is possible to conclude from your calculations that the Jones family is financially better off or worse off in June 2019 as compared with 2015

Work out Index number for each item  
this is a weight average

Food, alcohol & tobacco

$$106.4 \times \frac{17}{100} = 18.086$$

Clothing

$$102 \times \frac{8}{100} = 8.16$$

$$107.5 \times \frac{32}{100} = 34.4 \text{ etc}$$

Overall Weighted Index Number = 107.413

Because Jones Weight Number < 107.9

they will be financially better off.

Addup · 107.413



The partially completed table below shows the mean children's admission price and chain base index number for some tourist attractions in Northern Ireland.

**Q5**

Year	2013	2014	2015	2016	2017
Mean price	£2.54	£2.88	£3.89		£3.78
Chain base index number	100	113.4		106.4	91.3

The chain base index number for 2014 is 113.4

(a) Give an interpretation of this number.

The mean price is 13.4% more expensive in 2014 compared with 2013

[2]

(b) Calculate the mean price for 2016

2015                      2016  
 £3.89                      £4.14  
                                     106.4  
                                     → Answer £ 4.14 [2]

$\times 1.064$

(c) Calculate the chain base index number for 2015

2014              2015  
 2.88              3.89  
                             →  
                              $\times 1.351$               Answer 135.1 [2]

(d) Give one reason for using chain base index numbers instead of simple index numbers.

These reflect changes from year to year.  
so a drop in price next year will be less than 100 Chain Index [1]  
But looking at a simple index number for table above they would all be greater than 100