

# Quantitative skills

## Interpreting Index Numbers

### Method

You will not be required to calculate index numbers; instead you will be provided with index numbers and you will have to interpret the data.

Consider the data in the table below:

Year	Average house price (£000)	Index number
2007	200	100
2008	220	110
2009	230	115
2010	210	105
2011	195	97.57

[http://www.economicsonline.co.uk/Competitive\\_markets/Index\\_numbers.html](http://www.economicsonline.co.uk/Competitive_markets/Index_numbers.html)

The table shows average house prices from 2007 – 2011. Look at the index number column: 2007 has been given the base number of 100 (this is normally the number given for the chosen base year). The base year is the year that is used for comparison with data in the other years.

The difference in the index number for a given year compared to the base year shows the percentage difference between the two years. For example, in 2008, the index number is 110 (this is calculated by adding the percentage increase between the average house prices in 2007 and 2008 i.e.

$$\frac{220 - 200}{200} \times 100 = 10\% \quad (100 + 10 = 110)$$

Remember, you do not need to know how to calculate index numbers for your exam; the calculation is just so you know where the index numbers originate.

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Therefore, if you were asked to interpret data in the table above, you now know that the index numbers show the percentage change (increase or decrease) from the base year after deducting 100. To illustrate this, consider the table below, which shows the percentage difference in house prices using the index numbers:

Year	Average house price (£000)	Index number	Percentage difference from base year (%)
2007	200	100	Base Year
2008	220	110	10
2009	230	115	15
2010	210	105	5
2011	195	97.57	-2.43

So, we can see from the table above that average house prices in 2009 were 15% higher compared to average house prices in 2007 (the base year). In 2011, average house prices fell by 2.43% compared to average house prices in 2007.

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### Example 1

The table below shows the average price of petrol in the UK in January of each year.

Year	Price of fuel (pence)	Index number
2007	87.4	100
2008	104	119.0
2009	87.2	99.8
2010	111.4	127.5
2011	127.8	146.2
2012	133.4	152.6
2013	132.9	152.1
2014	130.1	148.9
2015	108.2	123.8
2016	102.3	117.0

<https://www.petrolprices.com/the-price-of-fuel.html>

By what percentage did the price of fuel increase in 2011 compared to the base year? (Give your answer to 1.d.p. and include the correct unit of measurement).

Answer:

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### Example 2

The table below shows the average price of petrol in the UK in January of each year.

Year	Price of fuel (pence)	Index number
2007	87.4	100
2008	104	119.0
2009	87.2	99.8
2010	111.4	127.5
2011	127.8	146.2
2012	133.4	152.6
2013	132.9	152.1
2014	130.1	148.9
2015	108.2	123.8
2016	102.3	117.0

<https://www.petrolprices.com/the-price-of-fuel.html>

Which year represents the largest percentage change in fuel prices compared to the base year?

Answer:

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### Example 3

The table below shows the average price of petrol for each month of 2015.

Month	Average price of fuel (pence)	Index number
January	108.2	100
February	108	99.8
March	111.7	103.2
April	113.8	105.2
May	116.2	107.4
June	116.9	108.0
July	116.9	108.0
August	114.7	106.0
September	110.7	102.3
October	108.9	100.6
November	107.7	99.5
December	104.6	96.7

<https://www.petrolprices.com/the-price-of-fuel.html>

What was the percentage difference between fuel prices in September compared to the base month of January?

Answer:

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### Example 4

The table below shows the average price of petrol for each month of 2015.

Month	Average price of fuel (pence)	Index number
January	108.2	100
February	108	99.8
March	111.7	103.2
April	113.8	105.2
May	116.2	107.4
June	116.9	108.0
July	116.9	108.0
August	114.7	106.0
September	110.7	102.3
October	108.9	100.6
November	107.7	99.5
December	104.6	96.7

<https://www.petrolprices.com/the-price-of-fuel.html>

In which month did the average fuel price fall the most compared to the base month?

Answer:

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### Example 5

The table below shows the average price of a bed sold by a retailer.

Year	Average price of a bed (£)	Index number
2009	480	87.3
2010	495	90.0
2011	525	95.5
2012	550	100
2013	565	102.7
2014	570	103.6
2015	585	106.4

In which year was the biggest difference in the average price of a bed compared to the base year?

Answer:

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## Interpreting Index Numbers

### Example 6

The table below shows the average price of a bed sold by a retailer.

Year	Average price of a bed (£)	Index number
2009	480	87.3
2010	495	90.0
2011	525	95.5
2012	550	100
2013	565	102.7
2014	570	103.6
2015	585	106.4

By what percentage did the price of an average bed increase in 2014 compared to the base year?

Answer:



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## Interpreting Index Numbers

### Example 7

The data in the table below shows average house prices in the UK.

Year / Quarter	Average house price	Index number
2014 Q1	£178,124	87.2
2014 Q2	£186,544	91.3
2014 Q3	£188,810	92.4
2014 Q4	£189,002	92.5
2015 Q1	£188,566	92.3
2015 Q2	£194,258	95.1
2015 Q3	£195,733	95.8
2015 Q4	£197,044	96.5
2016 Q1	£198,564	97.2
2016 Q2	£204,238	100

<http://www.housepricecrash.co.uk/indices-nationwide-national-inflation.php>

In what quarter of 2015 did average house prices differ the most from the base quarter?

Answer:

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### Example 8

The data in the table below shows average house prices in the UK.

Year / Quarter	Average house price	Index number
2014 Q1	£178,124	87.2
2014 Q2	£186,544	91.3
2014 Q3	£188,810	92.4
2014 Q4	£189,002	92.5
2015 Q1	£188,566	92.3
2015 Q2	£194,258	95.1
2015 Q3	£195,733	95.8
2015 Q4	£197,044	96.5
2016 Q1	£198,564	97.2
2016 Q2	£204,238	100

<http://www.housepricecrash.co.uk/indices-nationwide-national-inflation.php>

By what percentage did house prices change between Q3 2014 and the base quarter?

Answer:

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### Example 9

The table below shows the average price of an ounce of gold.

Year	Average price of an ounce of gold (\$)	Index Number
2015	1,160	133.2
2014	1,266	145.4
2013	1,411	162.0
2012	1,669	191.6
2011	1,572	180.5
2010	1,225	140.6
2009	972	111.6
2008	871	100

<http://www.statista.com/statistics/268027/change-in-gold-price-since-1990/>

In which year were gold prices at their highest?

Answer:

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### Example 10

The table below shows the average price of an ounce of gold.

Year	Average price of an ounce of gold (\$)	Index Number
2015	1,160	133.2
2014	1,266	145.4
2013	1,411	162.0
2012	1,669	191.6
2011	1,572	180.5
2010	1,225	140.6
2009	972	111.6
2008	871	100

<http://www.statista.com/statistics/268027/change-in-gold-price-since-1990/>

What was the percentage difference in gold prices between the base year and 2011?

Answer:

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### Answers

#### Example 1

46.2%

#### Example 2

2012

#### Example 3

2.3%

#### Example 4

December

#### Example 5

2009

#### Example 6

3.6%

#### Example 7

Q1 or 1

#### Example 8

7.6%

#### Example 9

2012

#### Example 10

80.5%