Simple index numbers

Grade 4 | Worked solutions

GCSE Statistics topic practice

1 The table shows index numbers for the price of a loaf of bread at a bakery.

Year	2020	2022	2024
Index number	100	108	125

a. Write down the base year. Give a reason for your answer. (1)

b. Write down the percentage increase in the price of the loaf from 2020 to 2024. (1)

c. The loaf cost £1.50 in 2020. Work out the price of the loaf in 2022. (1)

(3 marks)

a)

2020. The base year has an index number of 100

b)

$125 - 100 = 25$

The price went up by 25%

c)

$\frac{108}{100} \times 1.50 = 1.62$

a) 2020, index is 100 b) 25% c) £1.62

2 A monthly bus pass cost £60 in 2020 and £69 in 2023.

a. Using 2020 as the base year, work out the index number for the price of the bus pass in 2023. (2)

b. The index number for the price in 2025, using 2020 as the base year, is 124. Explain what this index number tells you about the price of the bus pass. (1)

c. Work out the price of the bus pass in 2025. (1)

(4 marks)

a)

Index number = price ÷ base year price × 100

$\frac{69}{60} \times 100 = 115$

b)

124 is 24 more than 100.

The price is 24% higher than in 2020.

c)

$\frac{124}{100} \times 60 = 74.4$

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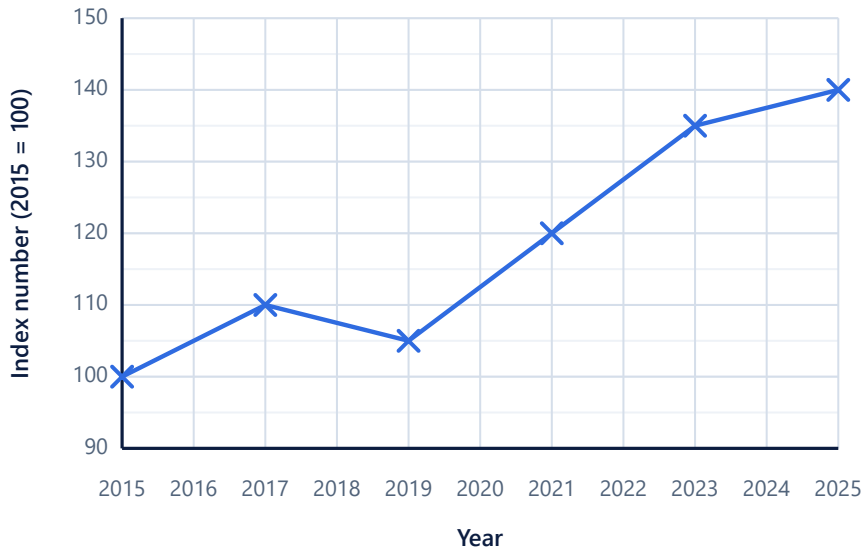
a) 115 b) 24% higher than in 2020 c) £74.40

3 The graph shows index numbers for the average price of a house in a town. The base year is 2015.

a. Write down the index number for 2021. (1)

b. The average price of a house in the town in 2015 was £180 000. Work out the average price in 2023. (2)

c. Between which two years shown on the graph did the average price fall? Give a reason for your answer. (1)



(4 marks)

a)

The point for 2021 is at 120

b)

The index number for 2023 is 135

$\frac{135}{100} \times 180\,000 = 243\,000$

The average price was £243 000

c)

Between 2017 and 2019

The index number went down from 110 to 105

a) 120 b) £243 000 c) 2017 to 2019, index fell

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4 The index number for the price of a rail season ticket in 2024, using 2019 as the base year, is 130. The season ticket cost £585 in 2024.

a. Work out the price of the season ticket in 2019. (2)

b. The index number for average wages in the same town in 2024, using 2019 as the base year, is 118. Zara says, "The season ticket was harder to afford in 2024 than in 2019." Is Zara correct? Give a reason for your answer. (2)

(4 marks)

a)

130 means the 2024 price is 130% of the 2019 price

2019 price × 1.3 = 585

2019 price = 585 ÷ 1.3

2019 price = 450

The ticket cost £450 in 2019

b)

The ticket price went up by 30%

Wages went up by 18%

Yes. The price went up faster than wages.

a) £450 b) yes, 30% rise but wages only 18%

5 A television cost £400 in 2018. The same model cost £340 in 2021.

a. Using 2018 as the base year, work out the index number for the price of the television in 2021. (2)

b. Explain what this index number tells you about the price of the television. (1)

c. The index number for the price in 2024, using 2018 as the base year, is 80. Lena says, "The index number went down by 5, so the price fell by 5% from 2021 to 2024." Is Lena correct? You must show your working. (2)

(5 marks)

a)

Index number = price ÷ base year price × 100

$\frac{340}{400} \times 100 = 85$

b)

85 is 15 less than 100

The price is 15% lower than in 2018

c)

Price in 2024

$\frac{80}{100} \times 400 = 320$

Fall from 2021 to 2024

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$340 - 320 = 20$

$\frac{20}{340} \times 100 = 5.9\%$

No. The price fell by about 5.9%, not 5%

a) 85 b) 15% lower than in 2018 c) no, it fell by 5.9%

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