

Percentage increases and decreases

Year 7 About 60 minutes Calculator allowed 48 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-7-percentage-increases-and-decreases/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] **A2** Needed today [1 mark]
 Write 35% as a decimal. Work out 15% of £60.

Answer

Answer

- A3** Last lesson [1 mark] **A4** From chapter 3 [1 mark]
 Write 18 out of 24 as a percentage. A bag holds 3 red and 5 blue counters. One is taken at random. Find P(blue).

Answer

Answer

B Example, then your turn

Year 7

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

A bike costs £260. Its price goes up by 15%.
 Use a multiplier to work out the new price.

Hint The old price is 100%. The new price is
 $100\% + 15\% = 115\%$ of it.

- B1** A tablet costs £180. Its price goes up by 35%. Use a multiplier to work out the new price. [2 marks]

Answer

EXAMPLE 2

A coat costs £85. In a sale its price is reduced by 30%. Work out the sale price.

Hint After a 30% cut you pay $100\% - 30\% = 70\%$ of the price.

- B2** (i) Reduce £64 by 15%. (ii) Reduce 3.5 kg by 8%. [3 marks]

Answer (i) (ii)

EXAMPLE 3

A plant is 24 cm tall. Its height increases by 175%. Work out its new height.

Hint $100\% + 175\% = 275\%$. A multiplier can be more than 2.

EXAMPLE 4

VAT of 20% is added to a price of £37.45. Work out the price including VAT.

Hint Multiply by 1.2. Money is written with two decimal places.

B3 The population of a town was 18 400. It increased by 130%.
Work out the new population. [2 marks]

Answer

B4 A meal costs £39.99. A service charge of 12.5% is added.
Work out the total cost, to the nearest penny. [2 marks]

Answer

c Practice

Year 7

C1 A shop works out its sale prices by multiplying by 0.65. What is the percentage reduction in the sale? [1 mark]

Answer

C2 Increase 52 m by 125%. [2 marks]

Answer

C3 A TV costs £360. Shop A takes 25% off. Shop B takes £85 off. Which shop is cheaper, and by how much? [3 marks]

Answer

C4 A recipe uses 450 g of flour. Tom uses 12% less flour. How much flour does Tom use? [2 marks]

Answer

C5 Kai is paid £8.40 an hour. His pay goes up by 6%. Work out his new hourly pay, to the nearest penny. [2 marks]

Answer

D1

In April 40 mm of rain fell. In May there was 50% less rain than in April. In June there was 50% more rain than in May. Sara says, "So June had the same amount of rain as April."

[3 marks]

Is Sara correct? You must show your working.

D2 A shop is planning a sale. The table shows some normal prices.

(a) Complete the table. [3 marks]

(b) Write down the multiplier for a 30% reduction. [1 mark]

Normal price	10% off	30% off
£40	£36	
£85		
£160		

Answer

(c) Max says, "Taking 10% off and then another 20% off is the same as taking 30% off." Use the £160 price to show that Max is wrong. [2 marks]

Total for D2: 6 marks

D3 A car is worth £14 500. In one year its value falls by 18%.

(a) Work out the value of the car after one year. [2 marks]

Answer

(b) In the next year its value falls by 18% again. Show that the car is then worth less than £10 000. [2 marks]

Total for D3: 4 marks

- D4** A plumber charges £65 for each hour of work and £28 for parts. VAT of 20% is added to the total. A job takes 3 hours. Work out the total cost of the job, including VAT. [4 marks]

Answer

- D5** In 2000 a website had 3200 users. By 2010 the number of users had increased by 240%. By 2020 the number had fallen by 15% from the 2010 number. How many users did the website have in 2020? [4 marks]

Answer

E Extension

Stretch

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** A shop increases the price of a jumper by 20%. Later it wants to put the price back to what it was before. By what percentage must it reduce the new price? Give your answer to 1 decimal place. [4 marks]

Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Choose a price to try, for example £100. What is the new price? How much must come off it?
- Hint 2** From £100 the new price is £120. You must take £20 off £120. Write 20 as a percentage of 120.
- Hint 3** $\frac{20}{120} = \frac{1}{6} = 16.66 \dots \%$, so 16.7%. It is not 20%, because the 20% is now taken from a bigger price.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

- I can write the multiplier for a percentage increase or decrease. ☐ ☐ ☐
- I can use a multiplier to increase or decrease an amount. ☐ ☐ ☐
- I can increase an amount by more than 100%. ☐ ☐ ☐
- I can explain why two changes in a row do not just add up. ☐ ☐ ☐