



1 VAT is charged at 20%. Work out the price including VAT of

- a. a bicycle that costs £240 before VAT
- b. a printer that costs £85 before VAT

(3 marks)

a)

$$240 \times 1.2 = 288$$

£288

b)

$$85 \times 1.2 = 102$$

£102

2 In a sale, all prices are reduced. Work out the sale price of

- a. a jacket with an original price of £65, reduced by 30%
- b. trainers with an original price of £80, reduced by 15%

(3 marks)

a)

$$65 \times 0.7 = 45.50$$

£45.50

b)

$$80 \times 0.85 = 68$$

£68

3 Kane buys a bike for £250.

A year later he sells the bike for £210.

Work out his percentage loss.

(3 marks)

$$\text{Loss} = 250 - 210 = £40$$

$$\text{Percentage Loss} = 40 \div 250 = 0.16$$

$$0.16 \times 100 = 16\%$$

16%

- 4 A coat costs £132 including VAT at 20%.
Work out the price of the coat before VAT.

(3 marks)

$$100\% + 20\% = 120\%$$

$$120\% = £132$$

$$1\% = 132 \div 120 = 1.10$$

$$100\% = 1.10 \times 100 = 110$$

$$\boxed{£110}$$

- 5 In a sale a pair of boots is reduced by 30%. The sale price is £42.
Work out the original price of the boots.

(3 marks)

$$100\% - 30\% = 70\%$$

$$70\% = £42$$

$$10\% = 42 \div 7 = 6$$

$$100\% = 6 \times 10 = 60$$

$$\boxed{£60}$$

- 6 A trader buys a table for £68.
She sells the table for £85.
Work out her percentage profit.

(3 marks)

$$\text{Profit} = 85 - 68 = £17$$

$$\text{Percentage profit} = 17 \div 68 = 0.25$$

$$0.25 \times 100 = 25\%$$

$$\boxed{25\%}$$

- 7 Samira bought a house for £240 000. She spent £20 000 on improvements. She then sold the house for £312 000.
Work out her percentage profit on the total amount she spent.

(3 marks)

$$240\,000 + 20\,000 = 260\,000$$

$$312\,000 - 260\,000 = 52\,000$$

$$\text{Percentage profit} = \frac{\text{profit}}{\text{cost}} \times 100$$

$$\frac{52\,000}{260\,000} \times 100 = 20$$

$$\boxed{20\%}$$

8

Dev buys 40 phones at £90 each. He sells 25 of them at £140 each and the other 15 at £110 each.

Work out his percentage profit. Give your answer correct to 1 decimal place.

(4 marks)

$$\text{Cost: } 40 \times 90 = 3600$$

$$25 \times 140 = 3500$$

$$15 \times 110 = 1650$$

$$\text{Income: } 3500 + 1650 = 5150$$

$$\text{Profit: } 5150 - 3600 = 1550$$

$$\frac{1550}{3600} \times 100 = 43.05$$

43.1%

9

In 2019 Femi bought a flat for £180 000.

In 2026 he sold the flat for £207 000.

Work out his percentage profit.

(3 marks)

$$\text{Profit} = 207000 - 180000 = £27000$$

$$\text{Percentage profit} = 27000 \div 180000 = 0.15$$

$$0.15 \times 100 = 15\%$$

15%

10

A supermarket sells two special offer boxes of cereal.

Box A: 500 g for £3.20, with 25% extra free

Box B: 750 g for £3.60, with 10% off the price

Decide which box is the better value for money. You must show your working.

(4 marks)

$$\text{Box A actually contains } 500 \times 1.25 = 625 \text{ g for } £3.20$$

Box A

$$320p \div 625 = 0.512p \text{ per gram}$$

$$\text{Box B actually costs } £3.60 \times 0.9 = £3.24 \text{ for } 750 \text{ g}$$

Box B

$$324p \div 750 = 0.432p \text{ per gram, so Box B is the better value}$$

- 11 A farm shop buys 200 kg of potatoes at 45p per kg. The potatoes are packed into 5 kg bags. Four of the bags are damaged and cannot be sold.

The shop wants to make a profit of 30% on what it paid for the potatoes. Work out the lowest price, per bag, at which it must sell the rest of the bags.

(4 marks)

$$200 \times 0.45 = 90$$

$$200 \div 5 = 40 \text{ bags}$$

$$40 - 4 = 36 \text{ bags to sell}$$

$$\text{Income needed: } 90 \times 1.3 = 117$$

$$117 \div 36 = 3.25$$

£3.25

- 12 A sofa has a price of £540 including VAT at 20%. In a sale, the price is reduced by 10%.

Work out the sale price before VAT is added.

(3 marks)

$$540 \times 0.9 = 486$$

This still includes VAT, so divide by 1.2

$$486 \div 1.2 = 405$$

£405

- 13 A shop buys phone cases for £3.20 each.

The shop sells each phone case for £4.40.

Show that the shop's percentage profit on each phone case is 37.5%.

(3 marks)

$$\text{Profit on each case} = 4.40 - 3.20 = £1.20$$

$$\text{Percentage profit} = 1.20 \div 3.20 = 0.375$$

$$0.375 \times 100 = 37.5\%, \text{ as required}$$

14

Gina buys 40 plants for £1.80 each.

She sells 32 of the plants for £3 each.

She sells the rest of the plants for £1.50 each.

Work out Gina's percentage profit.

(4 marks)

$$\text{Total cost} = 40 \times £1.80 = £72$$

Sales

$$32 \times £3 = £96, \text{ and the remaining 8 plants: } 8 \times £1.50 = £12$$

$$\text{Total sales} = 96 + 12 = £108$$

$$\text{Profit} = 108 - 72 = £36$$

$$\text{Percentage profit} = 36 \div 72 = 0.5 = 50\%$$

50%

15

Layla needs 18 identical notebooks for a club.

Shop A sells the notebooks at £1.20 each, with an offer of buy 2 get 1 free.

Shop B sells the notebooks at £1.05 each, with 10% off the total cost when you buy 15 or more.

Work out which shop is cheaper for 18 notebooks, and by how much.

(4 marks)

Shop A

$$\text{with buy 2 get 1 free, every 3 notebooks cost } 2 \times £1.20 = £2.40$$

$$18 \text{ notebooks} = 6$$

groups
of 3,
so

cost =

6 x

£2.40

=

£14.40

Shop B

$$18 \times £1.05 = £18.90, \text{ then } 10\% \text{ off gives } £18.90 \times 0.9 = £17.01$$

$$\text{Shop A is cheaper by } £17.01 - £14.40 = £2.61$$

- 16 A grocer buys a 25 kg sack of potatoes for £15.
He puts all the potatoes into 2.5 kg bags.
He sells each bag for £2.10.
He sells all the bags.
Work out his percentage profit.

(4 marks)

$$\text{Number of bags} = 25 \div 2.5 = 10$$

$$\text{Total sales} = 10 \times £2.10 = £21$$

$$\text{Profit} = 21 - 15 = £6$$

$$\text{Percentage profit} = 6 \div 15 = 0.4 = 40\%$$

40%

- 17 Kirsty buys a sofa costing £840
She pays a deposit of 35% of the cost.
She pays the rest of the cost in 12 equal monthly payments.
Work out the amount of each monthly payment.

(4 marks)

Deposit

$$35\% \text{ of } 840 = 0.35 \times 840 = 294 \text{ pounds}$$

Amount left to pay

$$840 - 294 = 546 \text{ pounds}$$

Each monthly payment

$$546 / 12 = 45.50 \text{ pounds}$$

£45.50

- 18 A florist buys 60 roses for a total of £45.
She sells all 60 roses at the same price each.
She wants to make a profit of at least 40%.
Work out the least possible price for each rose.

(5 marks)

$$\text{For a 40\% profit the total sales must be at least } 45 \times 1.4 = £63$$

$$\text{Price per rose} = 63 \div 60 = £1.05$$

So the least possible price is £1.05 per rose

£1.05

19

Rob and Sita buy a boat for £6400.

They pay for the boat in the ratio 5 : 3.

Later they sell the boat for £8800.

They share the money from the sale in the ratio 7 : 4, with Rob taking the larger share.

Work out Rob's percentage profit on the money he paid.

(5 marks)

Buying

$$5 + 3 = 8 \text{ parts, so 1 part} = 6400 \div 8 = £800. \text{ Rob paid } 5 \times 800 = £4000$$

Selling

$$7 + 4 = 11 \text{ parts, so 1 part} = 8800 \div 11 = £800. \text{ Rob receives } 7 \times 800 = £5600$$

$$\text{Rob's profit} = 5600 - 4000 = £1600$$

$$\text{Percentage profit} = 1600 \div 4000 = 0.4 = 40\%$$

40%

20

The price of a sofa is £480 plus VAT at 20%.

Zara pays for the sofa with a deposit followed by 8 equal monthly payments.

The ratio of the deposit to the total of the 8 monthly payments is 2 : 7.

Work out the amount of each monthly payment.

(5 marks)

$$\text{Total price} = £480 \times 1.2 = £576$$

$$\text{Total parts} = 2 + 7 = 9, \text{ so 1 part} = 576 \div 9 = £64$$

$$\text{Deposit} = 2 \times £64 = £128. \text{ Monthly payments total} = 7 \times £64 = £448$$

$$\text{Each monthly payment} = 448 \div 8 = £56$$

£56

21

The same jacket is sold in two shops.

Shop A: normal price £80, with $\frac{1}{5}$ off.

Shop B: normal price £84, with 25% off.

In which shop is the jacket cheaper, and by how much? You must show your working.

(4 marks)

Shop A discount

$$\frac{1}{5} \text{ of } £80 = £16, \text{ so the price is } £80 - £16 = £64$$

Shop B discount

$$25\% \text{ of } £84 = £21, \text{ so the price is } £84 - £21 = £63$$
$$£63 < £64, \text{ so the jacket is cheaper in shop B by } £1$$

Shop B, by £1 (Shop A: £64, Shop B: £63)