

# Percentages

ANSWERS

Calculator | 30 minutes | Total marks: 30

Name ..... Class .....

- 1 (a) Write down the multiplier for an increase of 12%

Answer 1.12 (1) [1 mark]

- (b) Write down the multiplier for a decrease of 7.5%

Answer 0.925 (1) [1 mark]

- 2 (a) Increase £640 by 15%

$$640 \times 1.15 (1)$$

Answer £ 736 (1) [2 marks]

- (b) Decrease 250 by 32%

$$250 \times 0.68 (1)$$

Answer 170 (1) [2 marks]

- 3 Write 45 as a percentage of 180

Answer 25 (1) % [1 mark]

- 4 (a) The price of a coat goes up from £80 to £92

Work out the percentage increase.

$$\frac{12}{80} \times 100 (1)$$

Answer 15 (1) % [2 marks]

- (b) The value of a car falls from £12 500 to £10 000

Work out the percentage decrease.

$$\frac{2500}{12500} \times 100 (1)$$

Answer 20 (1) % [2 marks]

5

A laptop costs £450 plus VAT at 20%

Work out the total cost of the laptop.

$$450 \times 1.2 \text{ (1)}$$

Answer £ 540 (1)

[2 marks]

6

Ava invests £3000 for 4 years at 2.5% compound interest per year.

Work out the value of the investment after 4 years.

$$\text{multiplier } 1.025 \text{ (1)}$$

$$3000 \times 1.025^4 \text{ (1)}$$

Answer £ 3311.44 (1)

[3 marks]

7

A car costs £18 000

Its value falls by 12% each year.

Work out the value of the car after 3 years.

$$\text{multiplier } 0.88 \text{ (1)}$$

$$18\,000 \times 0.88^3 \text{ (1)}$$

Answer £ 12 266.50 (1)

[3 marks]

8

(a) After a 15% pay rise, Dev earns £276 a week.

Work out his weekly pay before the rise.

$$115\% \text{ of the old pay} = 276 \text{ (1)}$$

$$276 \div 1.15 \text{ (1)}$$

Answer £ 240 (1)

[3 marks]

(b) In a sale, prices are reduced by 30%

The sale price of a lamp is £56

Work out the price before the sale.

$$70\% \text{ of the price} = 56 \text{ (1)}$$

$$56 \div 0.7 \text{ (1)}$$

Answer £ 80 (1)

[3 marks]

9

There are 500 bacteria in a dish. The number increases by 20% every hour.

(a) Write an expression for the number of bacteria after  $n$  hours.

Answer  $500 \times 1.2^n$  (1)

[1 mark]

(b) After how many whole hours will there first be more than 1000 bacteria?

$$500 \times 1.2^3 = 864 \text{ and } 500 \times 1.2^4 = 1036.8 \text{ (1)}$$

Answer  $4$  (1)

hours

[2 marks]

10

A sequence is given by  $u_{n+1} = 1.05u_n - 20$  with  $u_0 = 500$

Work out  $u_1$  and  $u_2$ .

$$u_1 = \underline{505 \text{ (1)}}$$

$$u_2 = \underline{510.25 \text{ (1)}}$$

[2 marks]

| Question | Topic                                             | RAG |
|----------|---------------------------------------------------|-----|
| 1        | I can write a multiplier                          |     |
| 2        | I can increase and decrease by a percentage       |     |
| 3        | I can write one number as a percentage of another |     |
| 4        | I can work out a percentage change                |     |
| 5        | I can use percentages in real situations          |     |
| 6        | I can work out compound interest                  |     |
| 7        | I can work out depreciation                       |     |
| 8        | I can find the original amount                    |     |
| 9        | I can set up and use a growth model               |     |
| 10       | I can use an iterative formula                    |     |