

# Percentages Revision

## Section A: Percentage Change

1. The population of a village increased from 234 to 275 during one year. Find the percentage increase.
2. When a beaker of sand is dried in a hot oven its mass reduces from 1.2kg to 870g. Find the percentage reduction in its mass.
3. A battery was tested and found to power a camera for 12 hours before it needed recharging. An improved version of the battery powered the camera for an extra 30 minutes. Find the percentage increase in the life of the batteries.
4. The average cost of a local telephone call dropped by 8p to 27p. Find the percentage reduction in the average cost of a local call.

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## Section B: Increasing and Decreasing

1. In a sale, all the prices are reduced by 30%. Calculate the sale price of the following items:
  - a. a bike that cost £250
  - b. a pair of gloves that cost £3.20
2. In 2004, 180 parents applied to a school for a place for their child. The following year saw an increase of 35% in the number of applications. Find the number of applications in 2005.
3. Following the opening of a new supermarket nearby, the number of customers using a small store decreased by 21%. If 2,400 customers used to use the store each week, find the number of customers after the store opened.

4. A car costs £9,999.90 before VAT (value added tax). Work out the cost including VAT if it is charged at 20%.
5. Sally's investment of £450 has gone up by 30%, while Susie's investment of £650 has gone down by 10%. Who now has the larger amount of money, Sally or Susie?
6. A train company increases its rail fares by 4% one year and by 6.5% the following year. Find the percentage increase in cost over the two years.

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## Section C: Reverse Percentage Problems

1. A jacket is reduced by 12% to £66 in a sale. Find the original price.
2. A baby's weight increases by 8% over a month from birth to 4.05kg, what was the weight at birth?
3. Which product has the greatest original price? Show your working.

~~£?~~  
20% off! Now £2.00

A

~~£?~~  
30% off! Now £1.60

B

4. The air pressure increases by 1.2% to 1,214.4 mbar. What was the original air pressure?
5. A dress in a sale is reduced by 7% to £60.45. What is the original price?
6. A stereo system is sold for £1,998 and an 11% profit is made. Find the original cost of the stereo.
7. A shop sells a television to a man and makes a 15% profit. The man sells it to another man for £414 at a loss of 10%. Find the original price of the television.

## Section D: Compound Interest

1. Jane invests £1,200 in a bank account which earns interest at the rate of 6% per annum. Find the value of a) the investment after 5 years b) the interest earned.
2. Craig puts £240 into a savings account. Each year the savings earn interest at 6% of the amount in the account at the start of the year. What will his savings be worth after 3 years? Give your answer to the nearest penny.
3. Each year a car loses value by 11% of its value at the start of the year. If it was worth £8000 when it was new, what will it be worth after 2 years?
4. A population of bacteria is estimated to increase by 12% every 24 hours. The population was 2000 at midnight on Friday. What was the population (to the nearest whole number) by midnight the following Wednesday?

5. Ambrose invested £3500 in a six-year bond that added 5% to the amount each year for the first three years and 7.5% each year for the next three years. What is the amount in the bond, to the nearest penny after six years?

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## Section E: Bonus Questions

1. Two numbers b and c are 20% and 28% less than the third number d. By what percentage is the number c less than the number b?
2. The ratio of two numbers is  $\frac{5}{6} : \frac{2}{3}$ . By what percentage is second number more or less than the first number?
3. 250% of x is increased by 250% to become 350. What is the value of x?

## Answers

### Section A

- 1) 17.5%
- 2) 27.5%
- 3) 4.2%
- 4) 22.9%

### Section B

- 1) a) £175 b) £2.24
- 2) 243
- 3) 1,896
- 4) £11,999.88
- 5) Same (£585)
- 6) 10.76%

### Section C

- 1) £75
- 2) 3.75kg
- 3) A
- 4) 1,200mbar
- 5) £65
- 6) £1800
- 7) £400

### Section D

- 1) a) £1,605.87  
b) £405.87
- 2) £285.84
- 3) £6,336.80
- 4) £3,524.68
- 5) £5,033.40

### Section E

- 1) 10%
- 2) 20% less
- 3) 40