

Percentages, Fractions, Scientific Notation and Statistics

1. Emma invested £4000 in a bank which paid 2.1% interest per year.
- (a) Calculate how much money Emma would have in her account after 3 years. **3**

- (b) How long would it take for Emma's money to increase by 15%? **3**

2. It is estimated that an iceberg weighs 84 000 tonnes.

As the iceberg moves into warmer waters, its weight decreases by 25% each day.

What will the iceberg weigh after 3 days in the warmer water?

Give your answer **correct to three significant figures.** **4**

3. Michael bought a used car in order to do it up for re-sale.

After a month he sold the car for £3900 and made a 30% profit.

How much did Michael pay for the car?

4. Evaluate $4\frac{1}{5} \times \frac{3}{7}$ **2**

5. A spider weighs approximately 19.06×10^{-5} kilograms.
A humming bird is 18 times heavier.

Calculate the weight of the humming bird.

Give your answer **in scientific notation.** **2**

6. Bottles of juice should contain 50 ml. The contents of seven bottles are checked in a random sample. The actual volumes in milliliters are as shown below.

52, 50, 51, 49, 52, 53, 50

Calculate the mean and standard deviation. **4**

7. The price, in pence per litre, of petrol at 10 city garages is shown below.

84.2	84.4	85.1	83.9	81.0
84.2	85.6	85.2	84.9	84.8

- (a) Calculate the mean and standard deviation of these prices. **4**
- (b) In 10 rural garages, the petrol prices had a mean of 88.8 and a standard deviation of 2.4.

How do the rural prices compare with the city prices? **2**

Answers

- (a) $4\,000 \times 1.021^3 = \mathbf{\pounds 4257.33}$ (b) $4000 \times 1.15 = \mathbf{\pounds 4600}$, **7 years**
- $84000 \times 0.75^3 = 35437.5$, **35 400 tonnes**
- $130\% = 3\,900$, $100\% = \mathbf{\pounds 3\,000}$, he paid **\pounds 3000**
- $9/5$
- $18 \times (19.06 \times 10^{-5}) = \mathbf{3.431 \times 10^{-3}}$
- mean = **51**, sd = **1.41**
- (a) mean = **84.33**, st deviation = **1.28**
 (b) The higher mean shows that, on average, the cost of petrol is higher at rural garages.
 (b) The higher standard deviation shows that the petrol prices in rural garages is more spread out (less consistent)

Extra help – Percentages, Fractions, Scientific Notation and Statistics

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1	Percentage Increase Ex 31.3 Page 329	Q1,2,3 Page 330
2	Percentage Decrease	Q 4,5 Page 331
3	Original Percentage Ex 31.8 Page 335 Ex 31.10 – 31.11 Page 336	Q 1 – 3 Page 335 Q 2 – 4 Page 337
4	Fractions Ex 21.1 - 21.3 Pages 221/3	Q 1-4 Page 224
5	Scientific Notation Ex 21.5 & 21.66 Pages 229/30	Q1 Page 231, Q10 Page 232
6	Standard Deviation Example 10.1 Page 76	Q 1,3,4 Page 83
7	Comparison of St Dev and Mean Example 10.2 Page 77	Q3 Page 77, Q3 Page 81