

## Past Paper Questions – by topic

### 1. Decimals, Fractions & Percentages

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### Decimals

1. Evaluate  $8.1 - 19.4 \div 4$  2 KU
2. Evaluate  $43 - 5.6 \times 4$  2 KU
3. Evaluate  $5.7 + 3.9 \times 4$  2 KU
4. Evaluate  $31.4 - 27.09 \div 3.$  2 KU

### Fractions

5. Evaluate  $4\frac{5}{6} + 2\frac{3}{5}$  2 KU
6. Evaluate  $4\frac{2}{5} - 1\frac{2}{3}$  2 KU
7. Evaluate  $2\frac{3}{4} \times 1\frac{1}{3}$  2 KU
8. Evaluate  $5\frac{1}{2} \div 1\frac{3}{8}$  2 KU
9. Evaluate:  $\frac{3}{8}$  of  $\left(1\frac{2}{3} - \frac{4}{7}\right)$ . 2 KU
10. Evaluate  $\frac{3}{7} \left(1\frac{5}{6} + \frac{3}{4}\right)$  2 KU

### Various

11. Evaluate  $23 + (-6)^2 \times \frac{3}{4}$  2 KU
12. Evaluate 32% of £850 2 KU
13. Find  $\frac{3}{8}$  of 544 2 KU

## Using Percentages

1. Bacteria in a test tube increase at the rate of 0.9% per hour.  
At 12 noon there are 4500 bacteria.  
At 3 pm, how many bacteria will be present?  
Give your answer to **3 significant figures**. 4 KU

2. In January 2001, it was estimated that the number of flamingos in a colony was 7000.  
The number of flamingos is decreasing at the rate of 14% per year.  
How many flamingos are expected to be in this colony in January 2005 ?  
Give your answer to the nearest **10**. 4 KU

3. In 1999, a house was valued at £70,000 and the contents were valued at £45,000.  
The value of the house **appreciates** by 7% each year.  
The value of the contents **depreciates** by 9% each year.  
What will be the **total** value of the house **and** contents in 2002 ? 3 KU

4. A factory was put on the market in January 2001.  
The site was in an excellent location so the value of the building has appreciated  
since then by 5.3% per year.  
Unfortunately the plant & machinery were poorly maintained and have  
depreciated by 8.5% per year.  
The value of the building was £435 000 and the value of the plant & machinery  
was £156 000 in January 2001.  
What would be the expected value of the complete factory in January 2003 ? 4 KU

5. How much would the Strachans pay  
for a new iron, priced £16.50 at Watsons ? 3 KU

**WATSON'S SALE**  
 **$66\frac{2}{3}\%$  off everything**

6. In 1995, the price of 1 litre of a certain kind of petrol was 54.9 pence  
By 1996, the price of 1 litre of the same kind of petrol had risen to 56.3 pence.  
The percentage increase for each of the next four years is expected to be the same  
as the percentage increase between 1995 and 1996.  
What is the price of 1 litre of petrol expected to be in the year 2000? 4 RE

**Reversing the change**

7. A computer is sold for £695. This price includes VAT at 17.5%  
Calculate the price of the computer **without** VAT. 3 KU

8. During the Christmas Sales a shopkeeper sold 60% of his "Santa Claus Dolls"  
He then found he was left with 50 dolls.  
How many dolls had he in stock to begin with ? 3 KU

9. Kerry bought a new car in 1996. When she sold it four years later, she found that it  
had reduced in value by 60% and she received only £4640.  
How much had Kerry paid for the car in 1996 ? 3 KU

10. James bought a car last year. It has lost  $12\frac{1}{2}\%$  of its value since then.  
It is now valued at £14 875.  
How much did James pay for his car. 2 KU

## Scientific Notation

1. Each of these large oil containers holds  $4.80 \times 10^8$  litres of the fuel. How many litres are there altogether in the full tanks shown ? Give your answer in scientific notation.



2 KU

2. A newspaper report stated "Concorde has now flown  $7.1 \times 10^7$  miles. This is equivalent to 300 journeys from the earth to the moon." Calculate the distance from the earth to the moon. Give your answer in **scientific notation correct to 2 significant figures.**

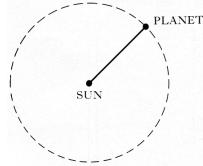
3 KU

3. The planet Mars is at a distance of  $2.3 \times 10^8$  kilometres from the Sun. The speed of light is  $3.0 \times 10^5$  km per second. How long does it take light from the Sun to reach Mars ?

**Give your answer to the nearest minute.**

3 KU

4. A planet takes 88 days to travel round the Sun. The approximate path of the planet round the Sun is a circle with diameter  $1.2 \times 10^7$  kilometres. Find the speed of the planet as it travels round the Sun.



**Give your answer in kilometres per hour, correct to 2 significant figures.**

4 KU

5. The mass of a proton is approximately  $1.8 \times 10^3$  times greater than the mass of an electron. If the mass of an electron is  $9.11 \times 10^{-31}$  kg, calculate the mass of a proton. Give your answer in **scientific notation correct to 2 significant figures.**

2 KU

6. Large distances in space are measured in light years. A camera on a space telescope, photographs a galaxy, a distance of 50 million light years away. One light year is approximately  $9.46 \times 10^{12}$  kilometres. Calculate the distance of the galaxy from the space telescope in kilometres. **Give your answer in scientific notation**

2 KU

7. The annual profit (£) of a company was  $3.2 \times 10^9$  for the year 1997. What profit did the company make per second. Give your answer to **three significant figures.**

2 KU

8. The total number of visitors to an exhibition was  $2.925 \times 10^7$ . The exhibition was open each day from 5 June to 20 September **inclusive**. Calculate the average number of visitors per day to the exhibition.

3 KU

9. The mass of the sun is  $2.2 \times 10^{30}$  kilograms. The mass of the earth is  $5.97 \times 10^{24}$  kilograms. Express the mass of the earth as a percentage of the mass of the sun. Give your answer in **scientific notation.**

3 KU