Countdown to your final Maths exam ... part 2 (2017)

	Marks	Actual	
Q1. Standard Form	**3**		
Q2. Standard Form	**4**		
Q3. Standard Form	**2**		
Q4. Standard Form	**4**		
Q5. Standard Form	**3**		
Q6. Standard Form	**6**		
Q7. Fractions	**2**		
Q8. Fractions	**3**		
Q9. Fractions	**5**		
Q10. Fractions	**2**		
Q11. Venn diagrams	**4**		
Q12. Venn diagrams	**6**		
Q13. Venn diagrams	**4**		
Q14. Fractions to decimals	**1**		
Q15. Fractions to percentages	**1**		
Q16. Decimals to fractions	**1**		

Q1. (a) Write 450 000 in standard form.

(1)

(b) Write 3.2×10^{-4} as an ordinary number.

(1)

(c) Work out $\sqrt[3]{6.4 \times 10^{10}}$

(1)

(Total for question = 3 marks)

Q2. (a) Write 0.0037 in standard form.

(1)

(b) Write 4.9×10^{4} as an ordinary number.

(1)

(c) Work out the value of

$$\frac{500}{250 \times 10^{3}}$$

Give your answer in standard form.

(2)

(Total for Question is 4 marks)

Q3.

Work out $\dfrac{4 \times 10^{9} + 3.2 \times 10^{7}}{1.6 \times 10^{-6}}$

Give your answer in standard form.

(Total for Question is 2 marks)

Q4. One uranium atom has a mass of 3.95×10^{-22} grams.

(a) Work out an estimate for the number of uranium atoms in 1kg of uranium.

(3)

(b) Is your answer to (a) an underestimate or an overestimate?

Give a reason for your answer.

(1)

(Total for question = 4 marks)

Q5. Rob is learning about the planets.

Rob makes a model of the Sun.
He also makes a model of the planet Jupiter.

Rob is going to hang the two models in the school hall.

Rob wants a distance of 16 m between the two models.
The real distance between the planet Jupiter and the Sun is 8×10^8 km.

Work out the scale Rob should use.
Give your answer in the form 1 : *n*

(Total for Question is 3 marks)

Q6. Modelling the planet Mercury as a sphere, it has a radius of 2440 km.

(a) (i) Work out an estimate in square kilometres for the surface area of Mercury.

(ii) Without carrying out a further calculation, give evidence to show whether your method gives you an underestimate or an overestimate for the surface area of Mercury.

(3)

In July 2013, the spacecraft Messenger was near Mercury at a distance of 9.75×10^7 km from Earth.

Taking the speed of light to be 3×10^8 m/s,

(b) work out how long it takes light to travel a distance of 9.75×10^7 km.

(3)

(Total for question = 6 marks)

Q7. Lethna worked out $\frac{2}{5} + \frac{1}{2}$

She wrote:

$$\frac{2}{5} + \frac{1}{2} = \frac{2}{10} + \frac{1}{10} = \frac{3}{10}$$

The answer of $\frac{3}{10}$ is wrong.

(a) Describe one mistake that Lethna made.

(1)

Dave worked out $1\frac{1}{2} \times 5\frac{1}{3}$

He wrote:

$$1 \times 5 = 5 \quad \text{and} \quad \frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

$$\text{so} \quad 1\frac{1}{2} \times 5\frac{1}{3} = 5\frac{1}{6}$$

The answer of $5\frac{1}{6}$ is wrong.

(b) Describe one mistake that Dave made.

(1)

(Total for question is 2 marks)

Q8. Work out $3\frac{4}{5} + \frac{3}{7}$

Give your answer as a mixed number in its simplest form.

(Total for question = 3 marks)

Q9. In a breakfast cereal, 40% of the weight is fruit.

The rest of the cereal is oats.

(a) Write down the ratio of the weight of fruit to the weight of oats.
Give your answer in the form 1 : *n*.

(2)

A different breakfast cereal is made using only fruit and bran.
The ratio of the weight of fruit to the weight of bran is 1 : 3

(b) What fraction of the weight of this cereal is bran?

(1)

(Total for question is 3 marks)

Q10. Work out $\frac{1}{3}+\frac{5}{9}$

(Total for question = 2 marks)

Q11.

$\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
$A = \{\text{multiples of } 2\}$
$A \cap B = \{2, 6\}$
$A \cup B = \{1, 2, 3, 4, 6, 8, 9, 10\}$

Draw a Venn diagram for this information.

(Total for question is 4 marks)

Q12. Sami asked 50 people which drinks they liked from tea, coffee and milk.

All 50 people like at least one of the drinks
19 people like all three drinks.
16 people like tea and coffee but do **not** like milk.
21 people like coffee and milk.
24 people like tea and milk.
40 people like coffee.
1 person likes only milk.

Sami selects at random one of the 50 people.

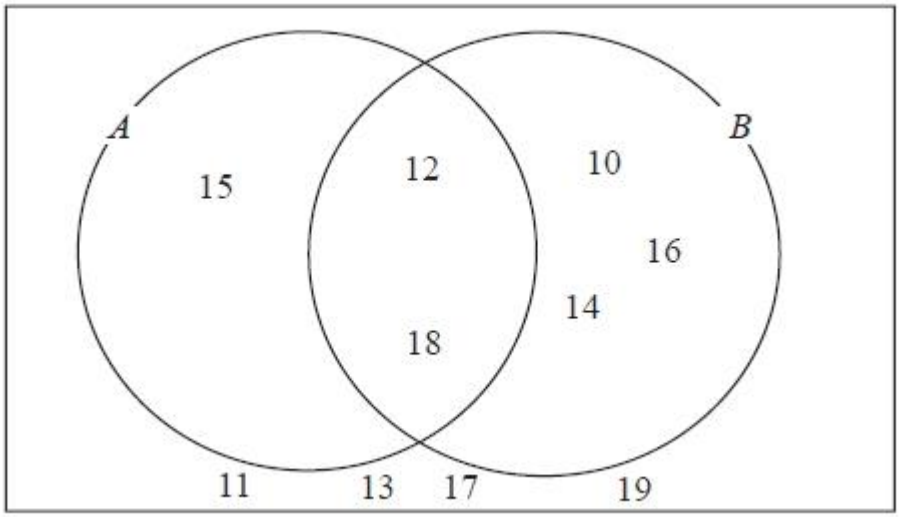
(a) Work out the probability that this person likes tea.

(4)

(b) Given that the person selected at random from the 50 people likes tea, find the probability that this person also likes exactly one other drink.

(2)
(Total for question = 6 marks)

Q13. Here is a Venn diagram.



(a) Write down the numbers that are in set

(i) $A \cup B$

(ii) $A \cap B$

(2)

One of the numbers in the diagram is chosen at random.

(b) Find the probability that the number is in set A'

(2)

(Total for question = 4 marks)

Q14. Write $\frac{7}{16}$ as a decimal.

(Total for question = 1 mark)

Q15. Write $\frac{3}{5}$ as a percentage.

(Total for question = 1 mark)

Q16. Write 0.19 as a fraction.

(Total for question = 1 mark)