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| **Maths Teacher** | **Tutor Group** |  **Name** [Print clearly] |

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| MAY EXAMINATIONS 2016 |
| SUBJECT: Year 7 Mathematics  |  |
| **Time allowed: 1.5 Hours** | **Total Marks: 135** |

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| READ THESE INSTRUCTIONS FIRST**Answer all questions****The number of marks is given in brackets [ ] at the end of each question or part question.** **This is a question and answer booklet. Write your answers in the spaces provided.****You may use a calculator.****SHOW YOUR WORKING AT ALL TIMES.****Do not use staples, paper clips, highlighters, glue or correction fluid.****Write in dark blue or black pen. You may use a pencil for diagrams, graphs or rough working.**

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| **Section** | **Topic** | **Marks** |
| **A** | **Whole Number**  | **35** |
| **B** | **Patterning and Algebra** | **25** |
| **C** | **Angles and Lines** | **15** |
| **D** | **Decimals** | **20** |
| **E** | **Directed Number** | **15** |
| **F** | **Problem Solving** | **25** |
|  | **Total Marks:** | **135** |

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**This document consists of 16 printed pages and 0 blank pages**

**Section A: Whole Number**

 **5 2 6 7**

1. Use **only** the digits above to create the following numbers.
2. A 2-digit multiple of 3

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. A prime number

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. A 2-digit square number

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. A factor of 12

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. Use the number 45802 to answer the following questions.
2. What is the **place value** of the 5?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. What is the **value** of the 8?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. Write the number in expanded form

*Answer(c)* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. Write down **all** the digits which are also **composite**  numbers

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. Use **leading figure** approximation to **estimate** the answer to the following: **Show working.**
2. $1536×24-7$

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. $429+3499÷3$

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. Answer the following.
2. Find the highest common factor of 16 and 24.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. Write 150 as a **product** of its prime factors.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. Find the lowest common multiple of 9 and 6

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. Put the following in **ascending** order.

$$770, 70, 700, 7, 707$$

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. Make the following numbers divisible by 3 by choosing a suitable number for the missing value.

$$36 127$$

 [2]

1. Round the following numbers:
2. $3498$ (to the nearest 1000) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
3. $70553$ (to the nearest 100) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
4. 19245 (to the nearest 10) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
5. Write the **operations** and **answer** in numerical form: Three hundred and six more than four thousand and eleven.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. Perform the following calculations **by hand** **showing full working**
2. 926 + 617 b) Find the difference between 8020 and 1278

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2] Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

 c) Find the product of 67 and 8 d) 4368 ÷ 6

 Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3] Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

**Section B: Patterning and Algebra**

1. Re-write the following using algebraic notation.
2. $3×x$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
3. $p÷4 $ \_\_\_\_\_\_\_\_\_\_\_\_ [1]
4. $4×(x-2)$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
5. Write down the next **two** terms in the patterns shown:
6. $4, 11, 18, 25…$ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_ [2]
7. $6, 18, 54, 162….$ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_ [2]
8. $2, 7, 9, 16…$ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_ [2]
9. **Simplify** the following expressions as far as possible.
10. $a+a+a$ (a)\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
11. $4b-b$ (b) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
12. $5c+c-2c$ (c) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
13. $7d+3a-5d+a$

 (d)\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. $4+e+7+2e-9$

 (e)\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. $3×f× $8 (f)\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
2. $7g×5$ (g)\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
3. $2×4h×i$ (h)\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
4. A matchstick pattern made up of irregular hexagons is shown below:



1. Sketch the next pattern in the box provided. [1]
2. Complete the table below showing the number of hexagons and the number of matchsticks for each diagram. [2]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| $$n$$ | 1 | 2 | 3 | 4 | 10 |
| $$M$$ | 8 |  |  |  |  |

1. Work out the formula to determine the number of matchsticks. [2]

$$M=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$

1. How many matches will there be in the diagram with 27 hexagons?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

**Section C: Angles and Lines**

1. Use the picture shown to answer the following questions:
	1. **Name** the angle marked with the double curved

line. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

* 1. What **type** of angle is <ABD

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

* 1. **Measure** the angle ABC

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  [1]

* 1. **Name** a pair of **adjacent** angles \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]
1. Draw the **obtuse** angle PQR, labelling the points P, Q and R and the vertex. [3]
2. Draw an angle of 256˚. [1]
	1. What type of angle have you drawn? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
3. Fill in the blanks with an appropriate word or number to make the sentence true.
	1. 30˚ is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of 60˚ [1]
	2. 45˚ is the supplement of \_\_\_\_\_\_\_ [1]
	3. An intersection is where two lines \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
	4. Two lines which will never meet are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
	5. The notation for a ray which passes from the point R through the point S is \_\_\_\_\_\_ [1]

**Section D: Decimals**

1. Perform the following calculations **by hand** **showing full working**
2. 35.2 + 7.84 b) 89.7 – 6.88

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2] Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

 c) $5.76×12$ d) $85÷8$ (your answer be given as a decimal)

 Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2] Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

 e) $17.4÷3$

 Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. Answer the following questions True or False
	1. 0.33 is $\frac{1}{3}$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
	2. 0.25 is a terminating decimal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
	3. 0.479 is 0.47 when rounded to two decimal places \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
	4. $\frac{5}{6}$ can be written as $0.8\dot{3}$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
2. Complete the table below: [6]

|  |  |  |
| --- | --- | --- |
| **Decimal** | **Percentage** | **Fraction**(does not need to be simplified) |
| 0.25 | (a) \_\_\_\_\_\_\_\_\_\_\_ | (b) \_\_\_\_\_\_\_\_\_\_\_\_ |
| 0.3 | (c) \_\_\_\_\_\_\_\_\_\_\_\_ | (d) \_\_\_\_\_\_\_\_\_\_\_\_ |
| 1.2 | (e) \_\_\_\_\_\_\_\_\_\_\_\_ | (f) \_\_\_\_\_\_\_\_\_\_\_\_ |

**Section E: Directed Number**

1. Use a directed number (integer) to represent each of the following:
	1. 7˚ below zero \_\_\_\_\_\_\_\_\_ [1]
	2. 4 km South \_\_\_\_\_\_\_\_\_ [1]
	3. Deposit of $20 \_\_\_\_\_\_\_\_\_ [1]
	4. 4 seconds after take-off` \_\_\_\_\_\_\_\_\_ [1]
2. Which of the integers $-10, 7, 3 and-2$ is closest to zero on the number line?

 \_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. Write down the numbers below which are **not** integers

$$32, -4, -\frac{1}{5}, 1, -0.2$$

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. Answer the questions below about coordinates.
	1. For the coordinate (3,-2), which number represents the $x$-coordinate? \_\_\_\_\_\_\_\_ [1]
	2. The point (0,0) is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]
	3. The vertical axis is also known as the \_\_\_\_ axis. [1]
2. Below is a graph showing 4 points. [6]
3. Write down the coordinates of the 4 points

**A**  \_\_\_\_\_\_\_\_\_\_\_\_\_

**B** \_\_\_\_\_\_\_\_\_\_\_\_\_

**C** \_\_\_\_\_\_\_\_\_\_\_\_\_

**D** \_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Plot** and **clearly label** the following 2 coordinates on the axes.

**E** $(0, 4)$  **F** $(-3,1)$

**Section E: Problem Solving**

1. Guan thinks of a one digit and a two digit number, he calculates the product to be 294 and the difference to be 35. What are the two numbers?

 \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ [2]

1. In Auckland Zoo the elephants and ostriches are kept in the same enclosure. Dana counts 17 heads and 40 legs. How many ostriches are there?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. Sam, Jacob, Louis, and Shani are all skilled at the game Temple Run. Shani consistently scores higher than Louis. Sam is better than all of them and Louis knows Jacob is not as good as him. Who is the better player, Shani or Jacob?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. Each team in a new netball league will play three games against each of the other teams. There are seven teams: the Albatross, the Kiwis, the Fantails, the Tuataras, the Moas, the Wetas, and the Pukekos. How many games will be played in all?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. There are 120 students in the middle school. Of those, 66 are going to the school social. The same number of students (66) are going to the school production, including 48 of those going to the social. How many students are neither going to the social nor going to the production.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. Harry the Dog loves to run. When we were walking home one day, he ran ahead of us, went all the way home, and then came back to meet us. He then ran back home again and came back to meet us. He did this three more times. Each time he came back, he met us at a point halfway from where he had left us. If he started running while we were 2400 metres away from home, how far did he run in total by the time he met us the fifth time?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. At the supermarket you can buy
	* + An orange and an apple for the price of a grapefruit
		+ An orange for the price of an apple and a peach
		+ Two grapefruits for the price of three peaches

One orange would cost the same as a certain whole number of a particular fruit. How many of which fruit?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. There is a five-digit number that has the following strange property: Put a 2 in front of this five-digit number. Multiply the resulting six-digit number by 3. The product is a six-digit number consisting of the original five-digit number followed by 2. What is the five-digit number?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. Six year old Rosie wants to write down all counting numbers up to one thousand. When she finished writing 12, she had written a total of 15 digits:

1 2 3 4 5 6 7 8 9 10 11 12

Rosie gave up after she had correctly written 2358 digits. What was the last number she wrote?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

End of exam.

Please be sure to **check** your answers and ensure working is shown

for questions worth more than one mark.