



Mission Heights Junior College  
Year 9 Examination 2018  
Subject: Mathematics

Name: \_\_\_\_\_ Class: \_\_\_\_\_  
\_\_\_\_\_

## Forest Whanau

Instructions:

Time allowed for this examination is 1 and a half hours.

You should attempt all the required questions in this examination. You are allowed to use a calculator.

Start writing when you are instructed to do so. You have 5 minutes of reading time before you start writing.

Use the space provided after each question to write all your answers with **the working shown very clearly**. If you need extra writing sheets then ask your teacher. Round your answers to 2 dp where applicable. Use only black or blue pen to write the paper. Use pencil only to draw the graph and diagrams.

Check that this booklet has pages 1-15 in the correct order and a separate planning sheet.

**YOU MUST HAND THIS BOOKLET TO THE TEACHER AT THE END OF THE TEST.**

Working Towards	Achieved	Merit	Excellence

## Water's Year 9 Mathematics Exam: WAME

Strand/Section	Working Towards	Achieved	Merit	Excellence
<b>Number</b>	You have attempted to solve problems involving integers, decimals and fractions	You have solved problems involving integers, decimals, fractions, simple interest, discount	You have solved number and simple interest problems	You have solved number problems in context involving several steps
<b>Algebra and graphs</b>	You have attempted to describe simple arithmetic or geometric patterns and plot and interpret simple graphs	You have described simple arithmetic or geometric patterns and plot and interpret simple graphs	You have found terms and rules for patterns and interpret linear graphs	You have solved algebra problems using graphs and manipulation
<b>Statistics</b>	You have attempted questions relating to graphs and perform basic statistical calculations	You have answered questions relating to graphs and perform basic statistical calculations	You have answered questions relating to graphs and perform basic statistical calculations	You have interpreted graphs and reports
<b>Examination Conditions</b>	You have completed this assessment, however you did not adhere to Examination conditions	You have completed this assessment, however you did not adhere to Examination conditions	You have completed this assessment, adhering to Examination conditions	You have completed this assessment, adhering to Examination conditions

**Section A: Number -**

Mohammed is a famous baker. The following questions are about his bakery.

**QUESTION ONE**

(a) Each day Mohammed makes 300 pies. How many pies does he make each week, if the bakery is open 6 days a week? **(A)**

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(b) Harrison works at the bakery 5 days a week. He is paid \$870 each week. How much does Mason get paid per day? **(A)**

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(c) Harrison's normal work days is 8 hours long. Next week he has been asked to work 10 hours each day. Calculate the amount Harrison will get paid next week. Use the information in question (b) to help you. **(M/E)**

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(d) Pies take longer to cook than Sausage Rolls. A pie takes 54 minutes to cook. A Sausage roll takes  $\frac{2}{3}$  of this time. How long does it take to cook a Sausage Roll? **(M)**

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(e) The bakery only sells two varieties of pies, these are Mince and Mince'n'Cheese. They are sold in the ratio of 2:3. If 300 pies were sold yesterday, how many would have been Mince'n'Cheese? **(E)**

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(f) Mohammed needs to make 80 Chocolate Muffins as Prabhjot ordered 80 Chocolate muffins as he had a photography conference. Muffins are baked in trays. Each tray cooks 12 muffins. The recommended cooking time a tray of muffins is 30 minutes. Mohammed's oven can only fit two muffin trays. How long will it take Mohammed to cook 80 muffins? **(E)**

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## QUESTION TWO

Harrison is saving for a car. He is saving 15% of his \$870 pay each week.

- (a) Write 15% as a fraction. (A)

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- (b) Calculate 15% of \$870. (M)

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(c) Harrison's is trying to save \$5000 for his car. How many weeks will it take him to save \$5000?

(M)

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(d) If Mohammed puts his \$5,000 in a savings account and earns 3% compound interest per year, calculate the value of his savings account at the end of two years. (E)

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## QUESTION THREE

The ingredients Mohammed uses for one tray of Chocolate Muffins are as follows.

- 2 cups [flour](#)
- $1\frac{1}{2}$  cups [sugar](#)
- $\frac{3}{4}$  cup [cocoa powder](#)
- 1 cup [milk](#)
- $\frac{1}{2}$  cup [vegetable oil](#)
- $1\frac{1}{2}$  teaspoon [baking powder](#)
- $\frac{1}{2}$  teaspoon [baking soda](#)
- 2 medium [eggs](#)

- (a) How many cups of sugar would be needed for 6 trays of muffins? (M)



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### QUESTION FIVE

Calculate the following:

(a)  $-9 \times -3 =$

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b)  $-6 + 8 =$

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(c)  $21 - 2 \times 5 =$

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(d)  $(-2)^5 =$

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(e)  $3(6 - 2) + 2(7 - 2) =$

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(f)  $8 + 2(7 - 9)^2 - 3 =$

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## Section B: Algebra and patterns and graphs

### QUESTION ONE

Simplify the following

(a)  $3x + 4y + 2x + y =$  (M)

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(b)  $8w \times 9 =$  (A)

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(c)  $8w + 3z - w - 2z =$  (M)

---

(d)  $p \times p \times p \times =$  (M)

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(e)  $\frac{y^5}{y^2} =$  (M)

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(f)  $6z \times 9z =$  (E)

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(h)  $3f^4 \times 5f^3 =$  (E)

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### QUESTION TWO

(a) If  $x = 2$  and  $y = 6$  find the value of  $4x - y$ . (M)

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(b) The formula for the area of a semi-circle is :  $A = \frac{1}{2} \pi r^2$  (A = area r = radius)  
Calculate the area of a semi-circle that has a radius of 5 cm. (E)

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### QUESTION THREE

Expand and simplify the following

(a)  $3(x + 4) =$  (A)

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(b)  $w(w + 5) =$  (M)

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(c)  $2(5k - 4) + 2(4k - 5) =$  (E)

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### QUESTION FOUR

Solve the following equations

(a)  $3x = 21$  (A)

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(b)  $w + 6 = 11$  (A)

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(c)  $7x - 4 = 24$  (M)

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(d)  $3(x - 4) = 9$  (M)

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### QUESTION FIVE

The supermarket hires a carpet cleaning machine. The cost to hire the machine is a \$50 fee plus \$15 per hour.

- (a) Write an equation for the cost of hiring the machine, using  $C$  = cost and  $h$  = hour (M)

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- (b) Varish hired the carpet cleaner for 3 hours. How much did he pay? (M)

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- (c) Ruby paid \$140 when she hired the carpet cleaner. For how many hours did Ruby hire the cleaner? (E)

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### QUESTION SIX

Factorise the following

- (a)  $4x + 32 =$  (A)

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(b)  $8y^2 - 56y =$  (M)

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- (c)  $4x^6y - 48x^2y^3 =$  (E)

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### QUESTION SIX

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---

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**QUESTION SEVEN**

The height of a rectangle is 3 times larger than the base. The perimeter of the rectangle is 16 units.

Write an equation using the information above. Then use the equation to find the dimensions and area of the rectangle. (M/E)

( Draw your diagram here)

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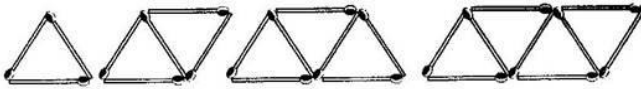
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**QUESTION EIGHT**

Elsa made patterns with matchstick. Below are his designs.



(a) Draw the fifth part of this pattern. (A)

(b) Complete the table below for Elsa's pattern (A)

Pattern Number	Number of Matches
1	3
2	5
3	
4	
5	
6	

(c) Complete this equation for the pattern:

M = Matches P = Pattern Number

M = \_\_\_\_\_ (M)

(d) Use the formula above to calculate the number of matches that would be needed to make the 20<sup>th</sup> part of this pattern. (M)

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(e) If Ruby used 79 matches, what part of the pattern did she complete? (E)

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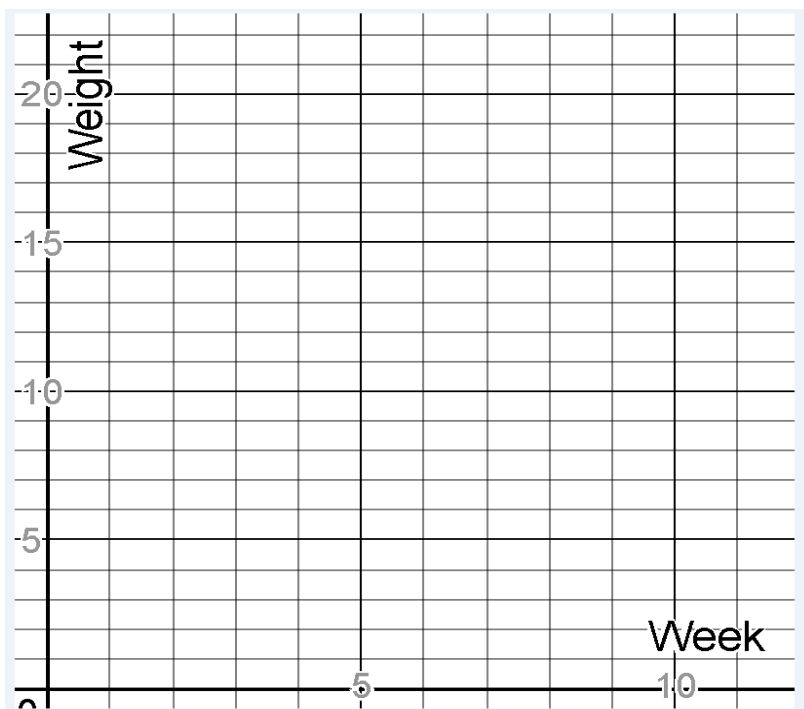
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### QUESTION NINE

The school Enviro Committee has been collecting data on the amount of paper collected from paper recycling bins this term. The results are recorded in the table:

Week	Weight of paper (kg)
1	9.5
2	11
3	12.5
4	14
5	15.5
6	17
7	18.5
8	20
9	21.5

(a) Plot the data on the axes below. (A)



(b) Predict the weight of paper that is likely to be collected in week 10. (M)

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(c) Write an equation for the graph above (M)  
(Use P= Weight of paper, W = week)

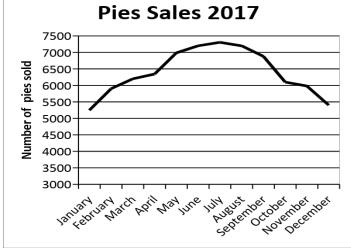
P = \_\_\_\_\_

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## Section c: Statistics -

### QUESTION ONE

Ken recorded the number of cream buns he sold at his cafe last week. The results are listed in the frequency table below.

Day	N
	 <p style="text-align: center;">umber of cream buns sold</p>
Monday	34
Tuesday	44
Wednesday	67
Thursday	55
Friday	64
Saturday	44

(a) What day did Ken sell the most cream buns? (A)

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(b) Calculate the mean number of cream buns sold. (M)

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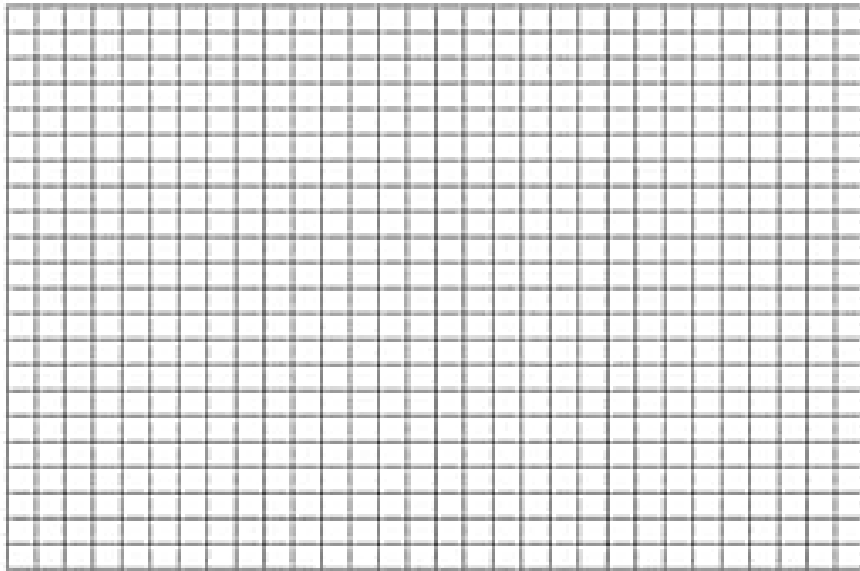
(c) What is the mode of the number of cream buns sold? (A)

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(d) Calculate the range of the number of cream buns sold. (M)

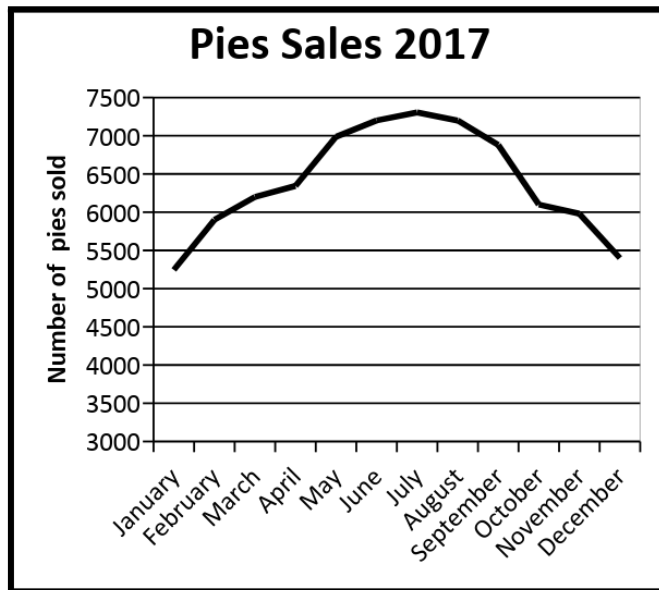
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(e) Draw a bar graph showing the number of cream buns sold. Graph must have a title and axis labels (A)



**QUESTION TWO**

The graph shows the number of pies sold each month in 2017.



(a) Describe the pattern of pie sales in 2017.

(M)

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(b) Discuss if the graph has been well drawn and gives an accurate reflection of the changes in pie sales per month. (E)

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**QUESTION THREE**

The number of white bread and brown bread sandwiches sold was recorded each day in Elsa’s cafe over the last 2 weeks.

White bread

229, 246, 256, 260, 279, 279, 280, 282, 284, 288, 289, 291

Brown Bread

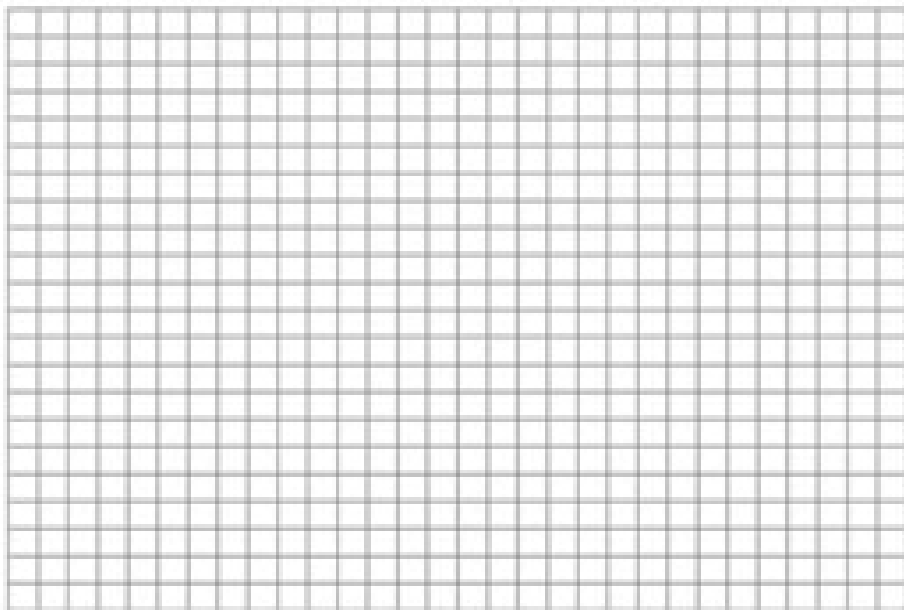
238, 241, 249, 254, 255, 256, 262, 263, 266, 268, 269, 270

(a) Complete the table below

(M/E)

	White bread	Brown bread
Lowest Value		
Lower Quartile		251.5
Median	279.5	
Upper Quartile	286	
Highest Value		

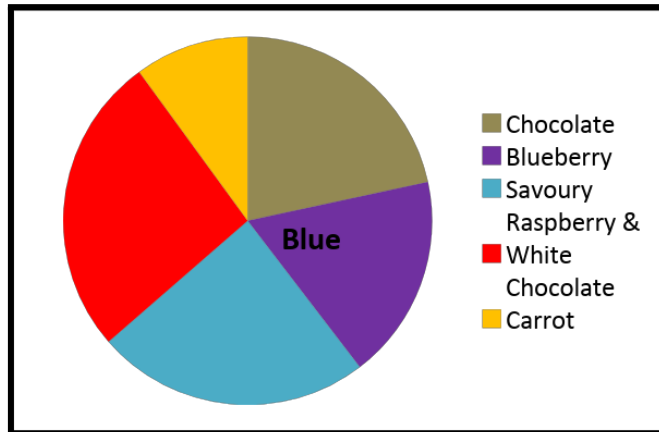
(b) Draw a double box and whisker plot to show the number of white bread and brown bread sandwiches sold. (E)



(c) Using features of the box and whisker plot, discuss the similarities and differences in the number of white bread and brown sandwiches sold.

**QUESTION FOUR**

Ken sold 500 muffins last week. The pie graph shows the quantity of each type of muffin the bakery sold last week.



(a) Ken wishes to only sell four types of muffins. Which muffin type should he stop selling? Give a reason for your answer. (A)

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(b) Calculate the amount of Raspberry & White plus Chocolate Muffins sold last week.

(M)

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