



**Mission Heights Junior College**  
**Subject: Mathematics CAT 2020**  
**Time: 1 hour**

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

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Instructions:

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-xx in the correct order and a separate planning sheet.

**OVERALL GRADE:**

Working Towards	AT	ABOVE	BEYOND

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

**Grading Feedback**

Section	Working Towards	AT	ABOVE	BEYOND
<b>A - Number</b>				
<b>B - Algebra</b>				

<b>and patterns</b>				
<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 \_\_\_\_\_ Show ALL working.**

**Ajay owns an Indian restaurant. The following questions are about his restaurant.**

**QUESTION ONE:**

(a) Each day Ajay makes 90 naan bread. How many naan bread does he make each week, if the restaurant is open 7 days a week?

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(b) Heena works at the family restaurant 3 days after school. She is paid \$135 each week. How much does Heena get paid per day?

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(c) Heena normally works from 4pm to 8 pm. During the school holidays she works from noon to 8pm Calculate the amount Heena will get paid during the two weeks of the school holidays. Use the information in question (b) to help you.

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(d) Naan bread takes 55 minutes to prepare and cook. Popodams are quicker to prepare and cook, they only takes  $\frac{2}{5}$  of the time compared to Naan bread. How long does it take to prepare and cook a Popodam?

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(e) The restaurant's best selling dishes are Rogan Josh and Butter Chicken. They are sold in the ratio 4:5. Last week the restaurant sold a total of 450 of these two dishes. How many Butter Chicken dishes were sold?

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(f) Each serving of butter chicken uses approximately 125 g of chicken. Ajay has 6 packets of chicken; each packet contains 500g of chicken. How many serves of butter chicken can he make?

## QUESTION TWO

Heena is saving for a school trip to Auckland. She saves 35% of her \$135 pay each week.

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(a) Write 35% as a fraction. \_\_\_\_\_

(b) Calculate 35% of \$135.

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(c) Heena is trying to save \$1500 for her trip. How many weeks will it take her to save \$1500?

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(d) Heena has already saved \$800. She has banked this into a special savings account. The account earns 2% Simple Interest per year; calculate the value of her savings account at the end of two years.

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**QUESTION THREE**

(a) Ajay purchases 1kg bags of rice for the restaurant. He thinks that some of his bags are not containing enough rice, so he weighs them to check. Below are the weights he found. Write the weights of these bags of rice in order from smallest to largest.

1.06kg 1.07kg 0.96kg 1.14kg 1.01kg 1.1kg

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(b) Add the weights above then round to the nearest the nearest kilogram.

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**QUESTION FOUR**

(a) Calculate the following:

(i)  $-8 \times 5 =$  \_\_\_\_\_

(ii)  $-3 + 9 =$  \_\_\_\_\_

(iii)  $33 + 2 \times -5 =$  \_\_\_\_\_

(iv)  $(-3)^3 =$  \_\_\_\_\_

(vi)  $10 + 5(10 - 8)^2 + 4 =$  \_\_\_\_\_

(b) The temperature of the freezer at the restaurant was -16 degrees when Ajay opened the door to store some chicken. By the time Ajay had finished stocking the shelves and closed the door the temperature had increased by 4 degree. What was the temperature of the freezer when Ajay closed the door?

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**QUESTION FIVE**

The ingredients for making one Naan bread are as follows.

- $3\frac{1}{2}$  cups [plain flour](#)
- $1\frac{1}{2}$  cups water
- $\frac{3}{4}$  tsp salt
- 1 tsp sugar
- $1\frac{1}{2}$  tsp yeast

(a) How many cups of water would be needed for 3 Naan bread?

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(b) Ajay has twenty tsp of yeast left. How many Naan bread can he make?

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(c) Ajay wishes to make 50 Naan bread for Saturday trading. Heena tells him he needs 20kg of flour. If one cup of flour equals 0.12kg, will 20kg of flour be enough for 50 Naan bread?? Give reasons for your answer.

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(c)  $7w - 6z - 2w - z =$  \_\_\_\_\_

(d)  $w \times w \times w \times w =$  \_\_\_\_\_

(e)  $\frac{x^7}{x^5}$  \_\_\_\_\_

(f)  $5x \times 3x =$  \_\_\_\_\_

(g)  $4y^3 \times 6y^5 =$  \_\_\_\_\_

### QUESTION TWO

(a) If  $x = 3$  and  $y = 7$  find the value of  $2x + 3y$ .

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(b) The formula for the area of a circle is :  $A = \pi r^2$  ( $A =$  area  $r =$  radius)  
Calculate the area of a circle that has a radius of 6 cm.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### QUESTION THREE

Expand and simplify the following

(a)  $5(x - 2) =$  \_\_\_\_\_

(b)  $y(2y + 6) =$  \_\_\_\_\_

(c)  $3(6x - 4) + 2(4x - 9) =$  \_\_\_\_\_

### QUESTION FOUR - Solve the following:

(a)  $4x = 36$

\_\_\_\_\_

\_\_\_\_\_

(c)  $5x + 2 = 32$

\_\_\_\_\_

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(d)  $2(y - 6) = 18$

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(e)  $4x + 3 = k - 9$

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### QUESTION FIVE

A car hire company charges a fee of \$45.99 a day plus an insurance charge of \$65.

(a) Write an equation for the cost of hiring the car, using **C** = cost and **d** = day

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(b) Hone hired a car for 5 days. How much did he pay?

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(c) Susan paid \$478.91 when she hired a car. For how many days did Susan hire the car?

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### QUESTION SIX

Factorise the following

(a)  $6x + 48 =$  \_\_\_\_\_

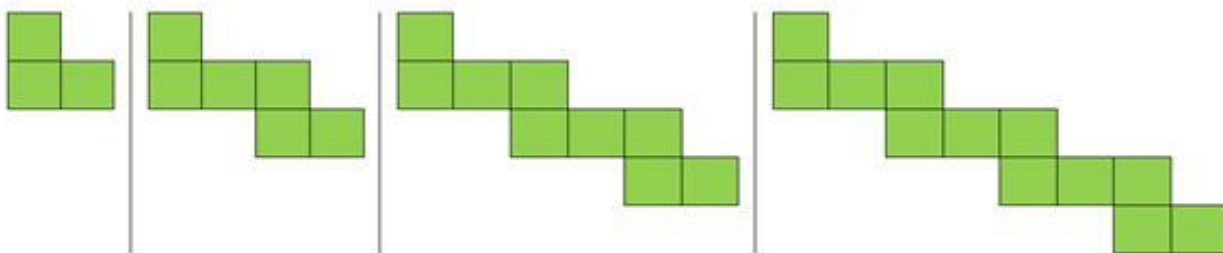
(b)  $3y^3 - 48y =$  \_\_\_\_\_

(c)  $5x^6y - 65x^3y^2 =$  \_\_\_\_\_

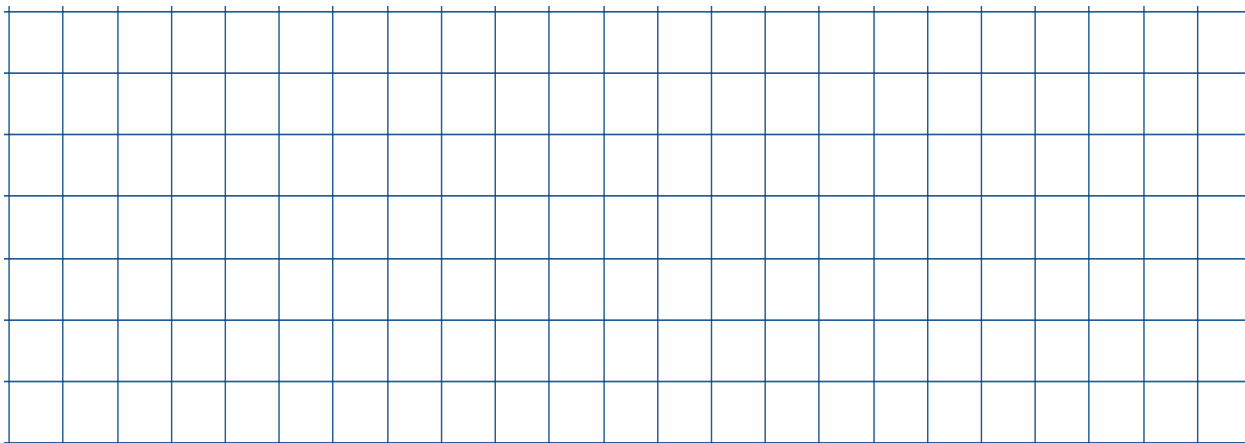
### QUESTION SEVEN

Below is a pattern of green bathroom tiles.





(a) Draw the fifth part of this pattern.



(b) Complete the table below for the pattern

Pattern Number	1	2	3	4	5	6
Number of Tiles						

(c) Complete this equation for the pattern:

Tiles = Matches  $P$  = Pattern Number

T= \_\_\_\_\_

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

\_\_\_\_\_

(e) If 111 tiles were used, what number of the pattern was made?

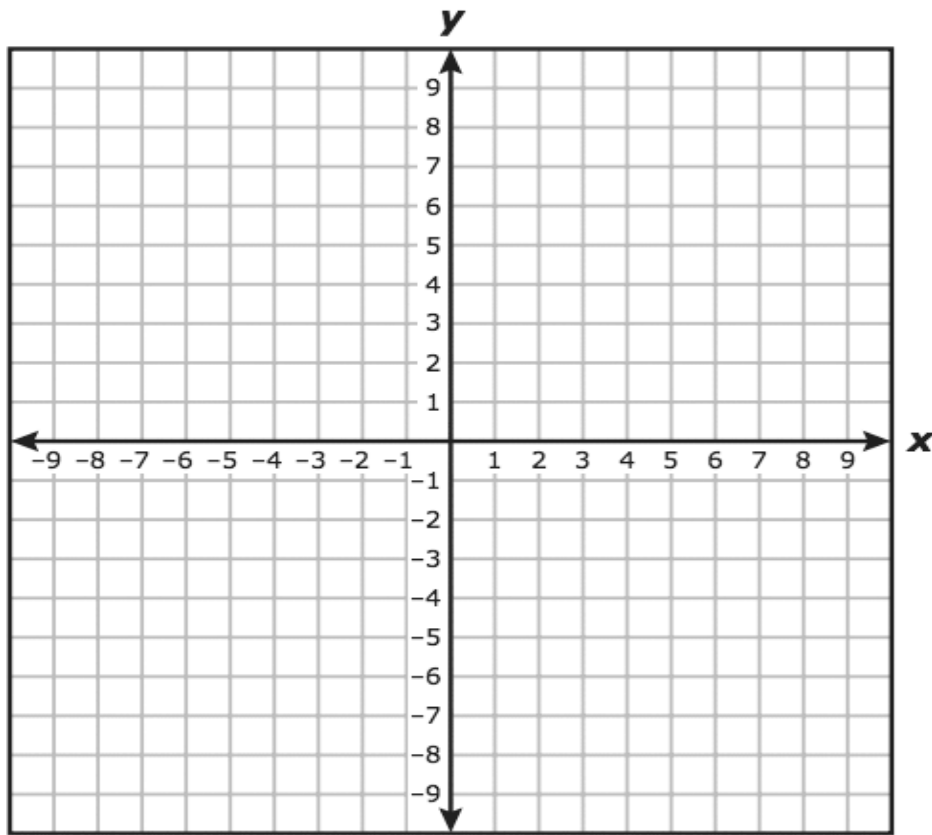
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## QUESTION EIGHT

(a) Plot the following points on the axes below.  
 (-3, -3), (-2, -1), (-1, 1), (0, 3), (1, 5), (2, 7), (3, 9)



(b) Write an equation for the graph above

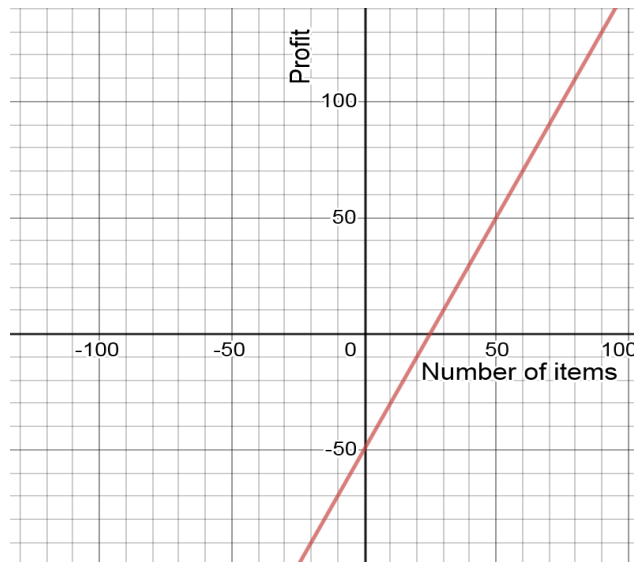
$y =$  \_\_\_\_\_

### QUESTION NINE

The student council is selling reusable beeswax sandwich wraps in an effort to reduce the amount of gladwrap being used to wrap students' food as a fundraiser.



This graph shows the profit that would be made from selling the wraps.



(a) How much profit will be made when 30 wraps have been sold?

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(b) How much did it cost the council to purchase the wraps?

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(c) Write the equation of the profit of selling the wraps.

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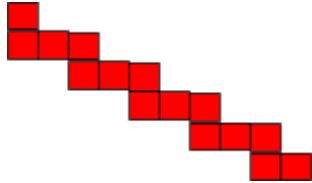
**Marking Schedule: Number**

	AT	AA	TAAB
ONE			
A -	630		
B -	\$45		
C -This question needs to either specify or hint 3days or all through the holidays	\$540 if same 3 days or \$900 for 80 hours - 8 hrs x 5 days = 40 hour per week		
D-	22 min		
E -	250 butter chicken		
F-		24 serves	
TWO			
A	$\frac{35}{100}$ or $\frac{7}{20}$		

B	\$47.25		
C -		32 weeks	
D-		\$ 832	
THREE			
A	0.96 1.01 1.06 1.07 1.1 1.14		
B-	6 kg		
FOUR			
A	1. -40 2. -27 3. 23	4. -27 5. 34	
B-	-12		
FIVE			
A -	$4\frac{1}{2}$ cups		
B-		13 naans	
C -			0.42g x 50 naans = 21 kg No - he can make 48 though
SIX			
		Above	654 meals

### Algebra

	At	Above	Beyond
Questions			
ONE			
A -	$5x + 6y$		
B	$22w$		
C-	$5w - 7z$		
D -	$w^4$		
E-		$x^2$	
F -		$15x^2$	
G -			$24y^8$
TWO			
A -	27		
B -		113.14 sqcm	

THREE			
A	$5x - 10$		
B -		$2y^2 + 6y$	
C			$26x - 30$
FOUR			
A	$x = 9$		
B -		$x = 6$	
C		$y = 15$	
D- ??			
FIVE			
A -	$C = 44.99d + 65$		
B-	\$295.95		
SIX			
A -		$6(x + 8)$	
B -		$3y(y^2 - 16)$	
C-			$5x^3y(x^3 - 13y)$
SEVEN			
A <b>Pattern drawn</b>			
B	3, 6, 9, 12, 15, 18		
C-	3p		
D-	60 tiles		
E -		37 pattern	
EIGHT			
A	<b>points plotted as below</b>		
B -		$y = 2x + 3$	
NINE			
A-		\$10	
B		\$50	
C-			$2x - 50$