



THE GOVERNMENT OF THE REPUBLIC OF TRINIDAD AND TOBAGO

MINISTRY OF EDUCATION

**NATIONAL CERTIFICATE OF SECONDARY
EDUCATION 2019**

(Level 1)

MATHEMATICS

PAPER II

TIME: 90 MINUTES

Student's Name _____

School's Name _____

School's ID

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Student's Number

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INSTRUCTIONS

Read the following instructions carefully.

1. This paper consists of TWO (2) sections – Section I and Section II.
2. There are six (6) questions in Section I and three (3) questions in Section II.
3. Answer ALL six (6) questions in Section I.
4. Answer ANY TWO (2) questions in Section II.
5. Write your answers in the spaces provided in this test booklet.
6. Write proper statements and show all working.
7. If you are finished before time has ended, go back and check your work.
8. Remember to complete the following on the cover of your answer booklet:
 - Student's Name
 - School's Name
 - School's ID
 - Student's Number
9. Candidates are permitted to use the following materials:
 - Calculators (Non-Programmable)
 - Geometry Set
 - Graph Paper (provided)

NO PROGRAMMABLE CALCULATORS MUST BE USED.

NO CELLPHONE CALCULATORS ARE ALLOWED.

SECTION I

ANSWER ALL QUESTIONS IN THIS SECTION

Write your answers in the spaces provided. Remember to show all working.

1. (a) Calculate, showing all working, the value of

$$\frac{3\frac{3}{5} - \frac{2}{3}}{1\frac{1}{10}}$$

(3 marks)

- (b) (i) The first four figures in a sequence are shown below.

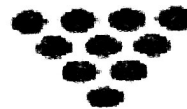


Figure 1

Figure 2

Figure 3

Figure 4

...

Figure 6

Draw **Figure 6** of the sequence.

(2 marks)

- (ii) How many dots would be in **Figure 8**?

(1 mark)

(Total 6 marks)

2. The Universal Set, $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$

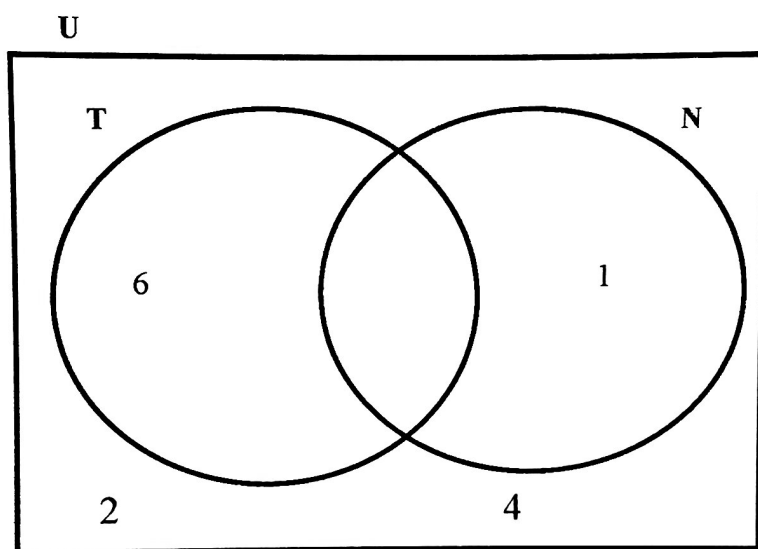
T and N are subsets of U.

$T = \{\text{multiples of 3}\}$

$N = \{\text{odd numbers}\}$

(a) Complete the Venn diagram to represent this information.

(2 marks)



(b) List the members of the set $(T \cap N)'$.

(2 marks)

(c) What is the probability that a number, chosen at random, is BOTH odd and a multiple of three?

(2 marks)

(Total 6 marks)

3. (a) Factorise completely.

(i) $x^2 + xy$

(1 mark)

(ii) $x^2 - 1$

(1 mark)

(b) Solve for x in

$$3(x - 3) = 15$$

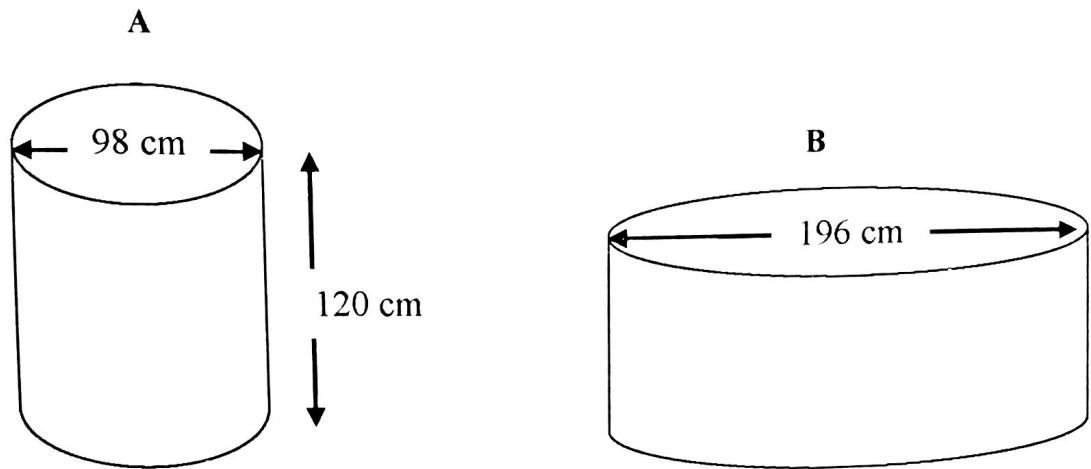
(2 marks)

(c) Given that $a = 2$ and $b = -3$, calculate the value of $(a - b)^2$

(2 marks)

(Total 6 marks)

4. A science lab has two cylindrical containers A and B (not drawn to scale), as shown below.



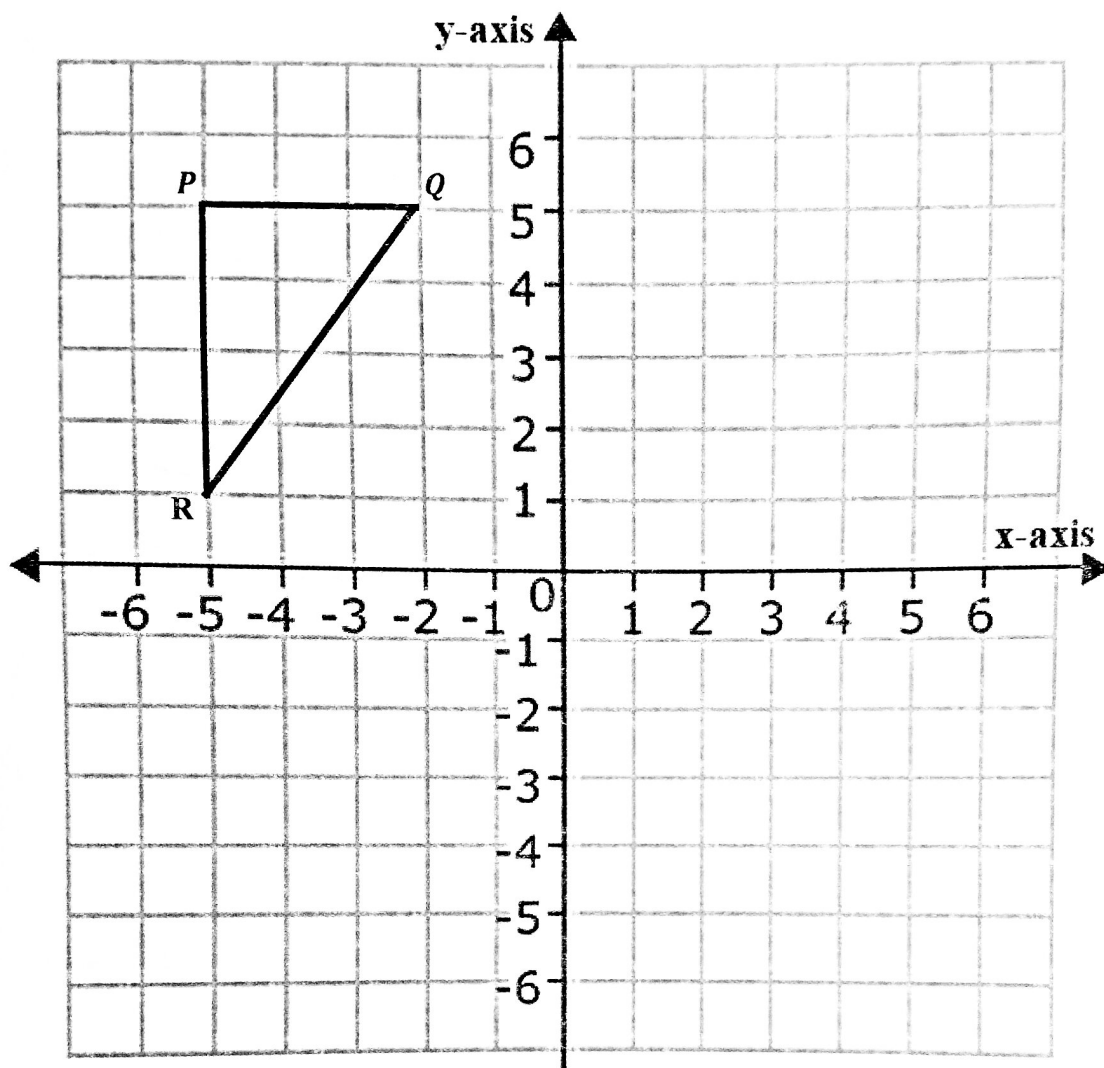
(a) Calculate the volume of container A (use $\pi = \frac{22}{7}$). (2 marks)

(b) State the number of litres of water that container A can hold. (1 000 cm³ = 1 litre). (1 mark)

(c) If ALL of the water in container A is emptied into container B, what will be the height of water in container B? (3 marks)

(Total 6 marks)

5. The diagram below shows the triangle PQR with coordinates P (-5, 5), Q (-2, 5) and R (-5, 1).



(a) The triangle PQR undergoes a reflection in the x-axis to form its image P'Q'R'.
On the diagram above, draw and label the image P'Q'R'.

(3 marks)

(b) P''Q''R'' is the image of P'Q'R' after it undergoes a translation $T = \begin{bmatrix} 7 \\ 2 \end{bmatrix}$.
State the co-ordinates of the image P''Q''R''.

P'' (,)

Q'' (,)

R'' (,)

(3 marks)

(Total 6 marks)

6. The marks of 35 students in a Mathematics class are as follows:

22 11 16 15 21 14 20
18 20 21 18 24 16 18
21 21 23 14 25 20 25
15 25 20 10 18 21 23
13 18 15 22 16 23 22

(a) Complete the frequency table to represent the data above:

Exam Marks	Tally	Frequency
6 - 10		
11 - 15		
16 - 20		
21 - 25		

(3 marks)

(b) How many students scored 15 marks or less in Mathematics?

(1 mark)

(c) What is the probability that a student chosen at random scored a mark greater than 20?

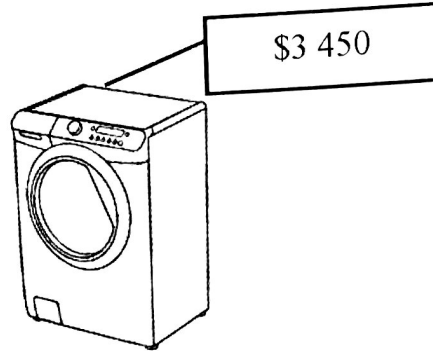
(2 marks)

(Total 6 marks)

SECTION II

ANSWER TWO (2) QUESTIONS ONLY FROM THIS SECTION

7 (a)



Washing Machine

PLAN A
10% Discount for Cash Payment

PLAN B
Down payment \$500. 30 Monthly Instalments of \$150.

- (i) Calculate the discount given in PLAN A.

(1 mark)

- (ii) Calculate the cost of the washing machine if bought using PLAN A.

(2 marks)

(iii) Calculate the cost of the washing machine if bought using PLAN B.

(2 marks)

(iv) Calculate the difference in the costs between PLAN A and PLAN B.

(1 mark)

(b) Using a pair of compasses, a ruler and a pencil ONLY, draw a line AB of length 5.5cm.

Construct a 60° angle at A.

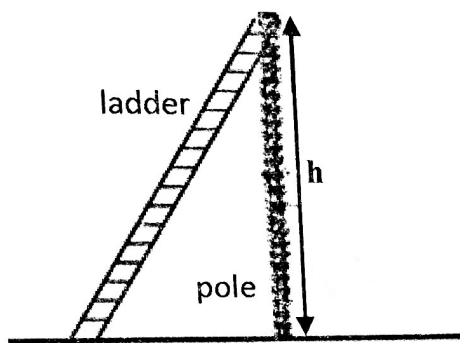
(3 marks)

(c) Construct the triangle PQR such that $PQ = 6$ cm, $QR = 8$ cm and angle $PQR = 90^\circ$.

(3 marks)

(Total 12 marks)

8. (a) The diagram shows a ladder, 15 metres long, resting against a vertical pole. The foot of the ladder is 12 metres away from the base of the pole.



- (i) Calculate the height, h , of the pole.

(3 marks)

- (ii) If the ladder slides 3 metres down the pole, calculate the new distance from the foot of the ladder to the base of the pole, to 1 decimal place.

(3 marks)

(b) (i) A flight from England to Dubai took $5\frac{1}{2}$ hours.

If the average speed of the flight was 885 kmh^{-1} , determine the distance, flown in kilometres .

(3 marks)

(ii) A ship sailed the same distance from England to Greece at an average speed of 150 kmh^{-1} . How long was the journey in hours?

(3 marks)

(Total 12 marks)

9. (a) Josh purchased 6 bottles of orange juice and 4 packs of biscuits for \$32.

Kevin purchased 4 bottles of orange juice and 2 packs of biscuits for \$20.

(i) Using x to represent the cost in dollars of one (1) bottle of orange juice and y to represent the cost in dollars of one (1) pack of biscuit, write two (2) equations in x and y to represent the information above.

(2 marks)

(ii) Using your equations from (i) above, determine the cost of one bottle of orange juice and the cost of one pack of biscuit.

(4 marks)

(b) The equation $y = 3x + 3$ represents the relation between two variables x and y .

(i) Use the equation given to complete the table below.

x	-1	0	1	2
y	0		6	

(2 marks)

(ii) Using a scale of 2 cm to represent 1 unit on both axes, on the answer sheet given, draw the graph of $y = 3x + 3$.

(2 marks)

(iii) Using the same answer sheet, in (b) above, draw the line $y = 7$.

(1 mark)

(iv) Label the point P, on the graph, where the lines $y = 7$ and $y = 3x + 3$ intersect.

(1 mark)

(Total 12 marks)

Answer Sheet for Question 9b.

Scale
x axis: 2 cm = 1 unit
y axis: 2 cm = 1 unit

