## **SL MATHEMATICS**

## Labour Day Review Packet

NAME: \_\_\_\_\_-

DATE: \_\_\_\_\_

1. The mean of the ten numbers listed below is 5.5.

4, 3, *a*, 8, 7, 3, 9, 5, 8, 3

- (a) Find the value of *a*.
- (b) Find the median of these numbers.

(Total 4 marks)

2. The sports offered at a retirement village are Golf (G), Tennis (T) and Swimming (S). The Venn diagram shows the numbers of people involved in each activity.



- (a) How many people
  - (i) only play golf?
  - (ii) play both tennis and golf?
  - (iii) do not play golf?
- (b) Shade the part of the Venn diagram that represents the set  $CG \cap S$ .

**3.** In the diagram, the lines  $L_1$  and  $L_2$  are parallel.



- (a) What is the gradient of  $L_1$ ?
- (b) Write down the equation of  $L_1$ .
- (c) Write down the equation of  $L_2$  in the form ax + by + c = 0.

(Total 4 marks)

- 4. A woman deposits \$100 into her son's savings account on his first birthday. On his second birthday she deposits \$125, \$150 on his third birthday, and so on.
  - (a) How much money would she deposit into her son's account on his 17th birthday?
  - (b) How much in total would she have deposited after her son's 17th birthday?

- (a) How many people
  - (i) only play golf?
  - (ii) play both tennis and golf?
  - (iii) do not play golf?
- (b) Shade the part of the Venn diagram that represents the set

5. The graph of  $y = x^2 - 2x - 3$  is shown on the axes below.



- (a) Draw the graph of y = 5 on the same axes.
- (b) Use your graph to find:
  - (i) the values of x when  $x^2 2x 3 = 5$
  - (ii) the value of x that gives the minimum value of  $x^2 2x 3$

(Total 4 marks)

- 6. Of a group of five students, two will be selected to visit the United Nations. The five students are John, Maria, Raul, Henri and Susan.
  - (a) With the aid of a tree diagram or a table of outcomes, find the number of **different** possible combinations of students that could go to the United Nations.
  - (b) Find the probability that both Maria and Susan will go on the trip.

7. Two jars contain a number of coloured balls as indicated in the diagrams below.



Two experiments are carried out.

First Experiment: A jar is first chosen at random and then a ball is drawn from that jar.

(a) Draw, **and label fully**, a tree diagram to show **all** possible outcomes of this experiment.

(b) What is the probability that a white ball is drawn?

*Second Experiment*: The ball drawn in the first experiment is not replaced. A second ball is then drawn from the same jar.

(c) What is the probability that both balls are white?

(2) (Total 7 marks)

(2)

(3)

8. The tuition fees for the first three years of high school are given in the table below.

Year	Tuition fees (in dollars)
1	2000
2	2500
3	3125

These tuition fees form a geometric sequence.

- (a) Find the common ratio, *r*, for this sequence.
- (b) If fees continue to rise at the same rate, calculate (to the nearest dollar) the total cost of tuition fees for the first six years of high school.

**9.** Mrs Harvey wants to put a 50 m long fence around her rectangular garden. She only needs to fence in 3 sides because the other side is alongside her house.



The width of the garden is denoted by *x*, and the length by *y*.

- (a) Write an expression for *y* in terms of *x*.
- (b) Write an expression for the area, A, of the garden, in terms of x.
- (c) If the area is  $200 \text{ m}^2$ , find the dimensions of the garden.

(Total 8 marks)

10. The figure shows two adjacent triangular fields ABC and ACD where AD = 30 m, CD = 80 m, BC = 50m. A  $\hat{D} C = 60^{\circ}$  and B  $\hat{A} C = 30^{\circ}$ .



- (a) Using triangle ACD calculate the length AC.
- (b) Calculate the size of  $A \hat{B} C$ .

11. In the diagram below ABEF, ABCD and CDFE are all rectangles. AD = 12 cm, DC = 20 cm and DF = 5cm.

M is the midpoint of EF and N is the midpoint of CD.



## (a) Calculate (i) the length of AF;

the length of AM. (ii)

(3)

Calculate the angle between AM and the face ABCD. (b)

(3) (Total 6 marks)