විශාඛා විද්‍යාලය - කොළඹ 05

Visakha Vidyalaya, Colombo 05

දෙවන වාර පරීක්ෂණය 2023 (2023 ඔක්තෝම්බර්)

Second Term Test 2023 (October 2023)

ගණිතය I Mathematics I	11 ශ්‍රේණිය Grade 11	පැයදෙකයි *Two hours*

Name/Index number : .....

Certified Correct

.....

Signature of Invigilator

Important :

* This question paper consists of **8** pages.
* Write your **Index Number** correctly in the appropriate places on **this page** and on **page three.**
* Answer **all** questions **on this question paper itself.**
* Use the space provided under each question for working and writing the answer.
* Indicate the **relevant steps** and the **correct units** when answering the questions.
* Marks are awarded as follows :
  In Part A
  2 marks for each question
  In Part B
  10 marks for each question
* Blank papers can be obtained for scratch work.

For Marking Examiners' Use Only		
Part	**Question Numbers**	**Marks**
A	**1 - 25**	
B	**1**	
	2	
	3	
	4	
	5	
Total		

..... First Examiner	..... Code Number
..... Second Examiner	..... Code Number
..... Arithmetic Checker	..... Code Number
..... Chief Examiner	..... Code Number

[See page two

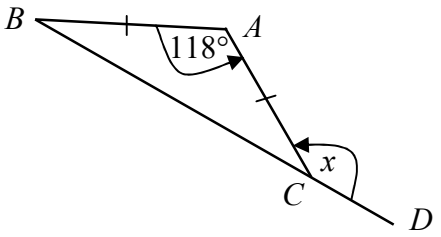
Part A

* Answer **all questions** on this paper itself**.**

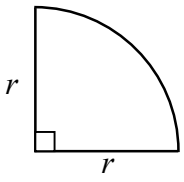
1. If 15 men need 12 days to complete a certain task. Find how many days needed to do the same task within 20 days.

2. Solve. $\frac{5}{2x} - \frac{2}{x} = \frac{1}{2}$

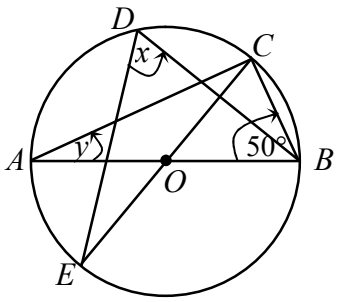
3. If $AB = AC$ find the magnitude of x.



4. If the area of the given sector is 38.5cm^2. Find the area of the circle which has the same radius.

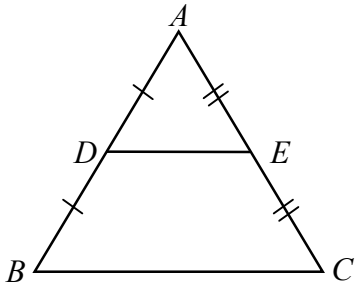


5. Points A, B, C, D and E are on the circumference of the circle with centre O. If $A\hat{B}C = 50°$ find the values of x and y.



6. If $Q_1 = 73$ in the given set of data. Find the total number of data
31, 56, 65, 73, 78, 83, 95 ……...

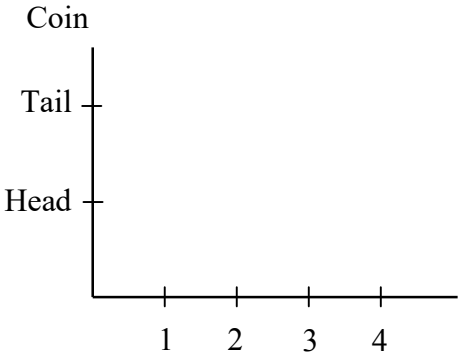
7. D and E are mid points of AB and AC of the given triangle ABC. If AB = 12cm, AC = 15cm and the perimeter of $BCED$ is 33.9cm. Find the length of BC.



[See page three

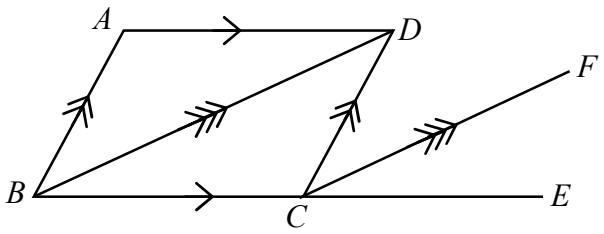
8. If $\log_x \frac{1}{64} = -3$, Find the value of x.

9. The sample space when a fair coin is tossed and regular tetrahedronal die is rolled together is given in the following grid. Find the probability of receiving a triangular number on the die and tail on the coin.

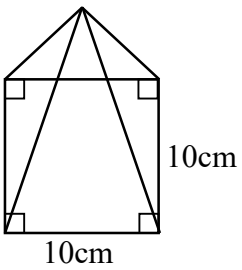


Regular tetrahedronal die

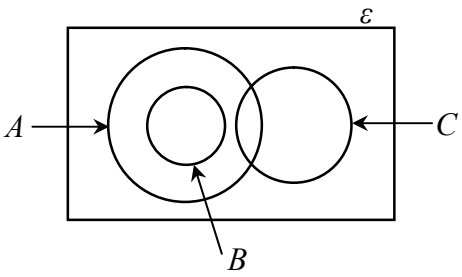
10. In the given rhombus $ABCD$, $BD//CF$. Explain with reasons how CF becomes the angle bisector of $D\hat{C}E$.



11. Side length of the base of the given square based right pyramid is 10cm. If the total area of the pyramid is 340cm^2. Find the area of one triangle.



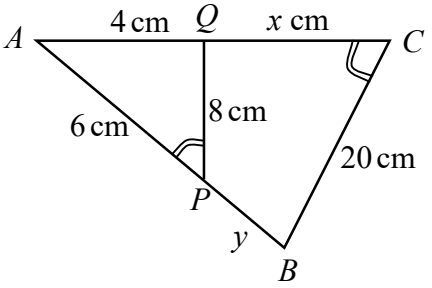
12. Name a pair of disjoint set in the given diagram. Explain the reason why it has become a disjoint set.



13. By what length is an actual length of 400m represented in a scale diagram which has been drawn to the scale 1 : 2500.

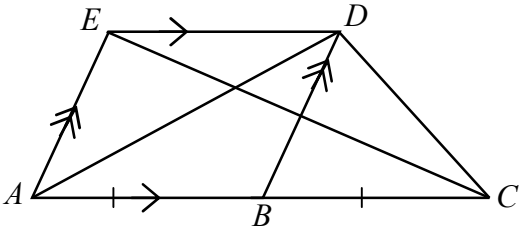
[See page four

14. If triangles *ABC* and *APQ* are equi – angular, find the lengths of *x* and *y*.



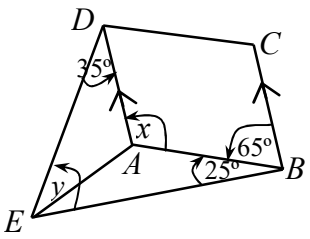
15. Find the least common multiple of the given algebraic expressions. $6x^2 + 3xy$, $(2x + y)^2$.

16. In the given diagram *ABDE* is a parallelogram. *B* is the mid point of *AC*. Explain with reasons for, area of Δ *CDE* = area of Δ *BCD*.



17. Factorize $1 - \frac{4x^2}{9}$

18. In the quadrilateral *ABCD*, *AD* //*BC* and *AB* = *AD* = *AE*. If $A\hat{B}C = 65°$, find the values of *x* and *y*.



19. Factorize. $6x^2 + x - 5$

20. Find the common ratio of the geometric progession whose first term is 7 and the 4^{th} term is 56.

[See page five

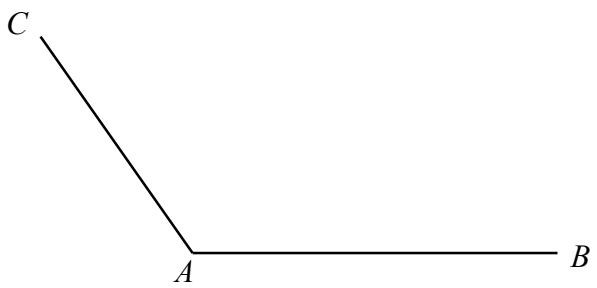
21. Find the radius of the base of a right cone if the volume and perpendicular height are 924cm^3 and 12cm respectively. (Volume of cone of radius r is $\frac{1}{3}\pi r^2 h$.)

22. Find the equation of the straight line parallel to $y = -\frac{2}{3}x - 5$ and which goes through the point (0, 1).

23. Simplify and rationalize the denominator. $\frac{1}{\sqrt{2}} + \frac{2}{\sqrt{8}}$

24. Solve. $\frac{x}{2} = \frac{2}{x}$

25. Using the knowledge of basic loci, draw a sketch to find the location of point X which is equi - distant to AB and AC and which is 3cm away from AB.



* *

[See page six

Part B

* Answere **all questions** on the paper it self.

1. For a certain assessment where the marks were given out of 100, $\frac{1}{3}$ of students in a class received marks in between 75 - 100 and $\frac{1}{4}$ of students received marks in between 50 – 75.

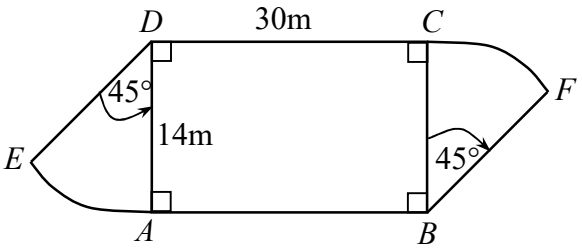
(i) Write the total fraction of students who received marks in those two intervals.

(ii) Out of $\frac{4}{5}$ of the remainder received marks in between 25 – 50. Write this amount of students as a fraction of total number of students.

(iii) If the remaining 4 students received marks in between 0 – 25, find the total number of students in the class.

(iv) There was an another assessment after this. Here 4 students who got marks in between 50 – 75 for the earlier assessment received marks between 75 – 100 for the new assessment. Find the percentage of students who received marks in between 75 - 100 now.

2. In the given diagram *ABCD* is a plot of vegetables of length 30m and breadth 14m. There are 2 ponds in the shape of sectors which are joined to the breadth of it.



(i) Find the arc lengths of *AE* and *CF*.

(ii) Find the perimeter of the whole figure.

(iii) Find the total area of the whole figure.

(iv) A right angled triangular plot of land which equals to the area of one pond is separated for fruit cultivation, by taking *BC* as one edge and the other edge on the side *DC*. Draw the sketch of the right angled triangle on the above diagram with relevant measurements.

[See page seven

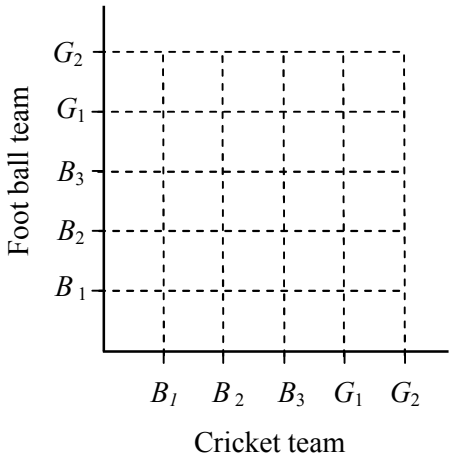
3. A person invested Rs. 108 000 and bought shares in a company at the market price of Rs.45 per share. The company pays annual dividends of Rs.6 per share. After receiving dividends for a year he sold all his shares at the market price of Rs.54.

(i) Find the annual dividends income he received.

(ii) Express his capital gain as a percentage of the amount invested.

(iii) He invested the money received by only selling shares to buy shares from another company at the market price of Rs.60. From this investment he gained an annual dividends income which is Rs.2880 more than what he received from his previous investment. Find the annual dividends per share that the second company paid.

4.(*a*) Following grid shows the sample space of selecting players for a foot ball team and a cricket team out of 3 boys and 2 girls. Here boys are denoted as B_1, B_2,$B_3$and girls denoted as $G_1$and G_2.

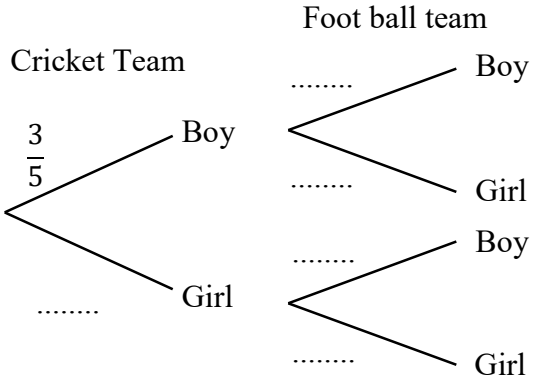


(i) Find the probability that the selected two are been boys.

(ii) Find the probability of selecting the same player for both teams.

(iii) Find the probabity of selecting at least one girl for those two teams.

(*b*) Complete the tree diagram to represent the sample space of selecting two players for those two teams.



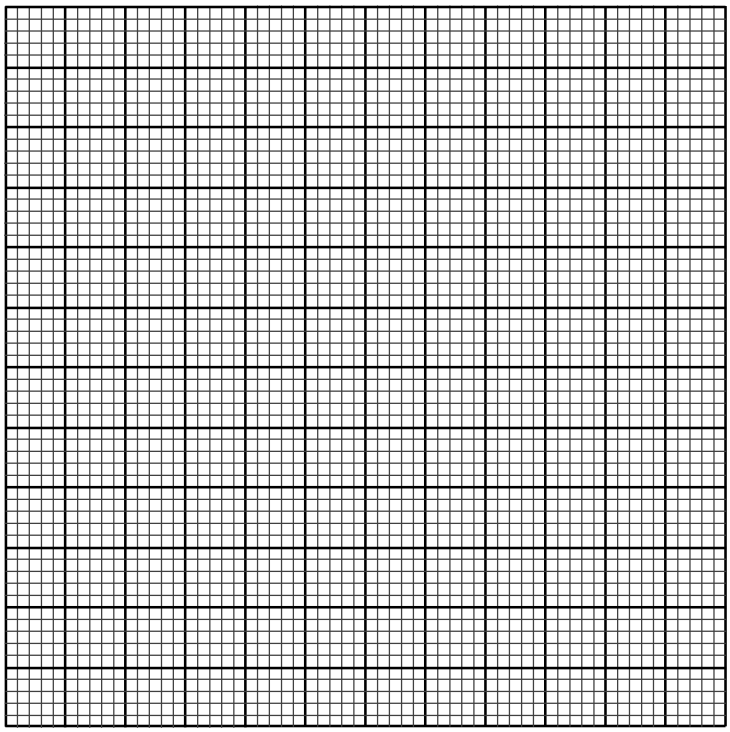
Using the tree diagram find the probability of selecting only one girl for two teams.

[See page eight

5. Following table shows ages of 100 selected contestants who took part for a certain reality show.

Age (Years)	Selected number of Contestants (Frequency)	Cumulutive Frequency
20 – 25	7	7
25 – 30	11	18
30 – 35	.....	33
35 – 40	18	51
40 – 45	20	71
45 – 50	12	.....
50 – 55	9	92
55 - 60	8	100

(i) Fill in the blanks.
(ii) Draw the Cumulutive frequency curve accordingly.



(iv) Using the Cumulutive frequency curve find the quartiles and the Inter Quartile range of ages of those selected contestants.

(v) Out of the selected contestants the oldest 25% were separated for another show. Find the age which should be considered to the nearest year when these oldest 25% contestants were selected.

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Visakha Vidyalaya, Colombo 05

දෙවන වාර පරීක්ෂණය 2023 (2023 ඔක්තෝම්බර්)
Second Term Test 2023 (October 2023)

ගණිතය II Mathematics II	11 ශ්‍රේණිය Grade 11	පැය තුනයි *Three hours*

- Write answers for **10** questions by taking **05** questions from **Part A** and **05** questions from **Part B.**
- Each question carries **10 marks.**
- Volume of right cylinder is $\pi r^2 h$, when the radius r and height h. Volume of a sphere of radius r is $\frac{4}{3}\ \pi r^3$.

Part A

* Answer **five** questions only.

1. A person takes a loan of Rs. 25 000 at an annual interest rate of 12% compounded annually. And he makes a down payment of Rs. 25 000 with that money in order to purchase a set of furniture worth Rs. 145 000 and paying the rest in 2 years in equal monthly installments of Rs. 5468.00.

(i) Find the annual interst rate charged if the interest is calculated on the reducing loan balance.

(ii) Calculate the total amount required to repay the initial loan of Rs. 25 000 in two years.

2. An incomplete table of values prepared to sketch the graph of $y = 2 - (x - 1)^2$ is given below.

x	–2	–1	0	1	2	3	4
y	–7	–2	1	…..	1	–2	–7

(i) Find the value of y when $x = 1$.

(ii) Draw the graph of the function by using a suitable scale.

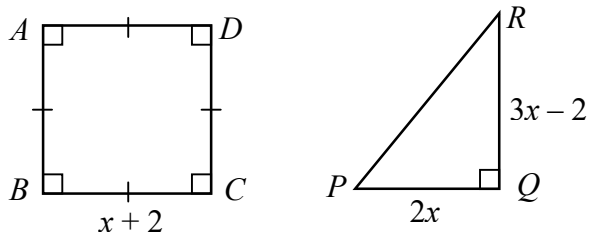
By using the graph,

(iii) find the roots of the equation $1 + 2x - x^2 = 0$

(iv) Write the function of the above graph in the form of $y = b - (x - a)^2$.

(v) By using only the positive root of the above equation find the value of $\sqrt{2}$.

3.



Area of square $ABCD$ and triangle PQR are equal.

(i) By using the given data show that x satisfies the quadratic equation $x^2 - 3x = 2$.

(ii) Solve the above quadratic equation by completing square or by some other method, find the lengths of PQ and QR of the triangle PQR to the nearest first decimal place.

(iii) Find the area of the triangle PQR.

[See page two

4. (*a*) There is a coconut tree 60m away from a house at a point called "*O"*, on a bearing of 075° and a well is located 84 m away from the coconut tree on a bearing of 200°.

(i) Draw a scale diagram using the scale 1 : 1200 for the above data.

(ii) By using it find the bearing of house from the well and find the diatance in between them.

(*b*) *AB* is a vertical post of height 12m. There is a car at the point '*C*' which is parked few meters away from the foot of the post. Angle of depression of the car from the point '*B*' on top of the post is 65°.

(i) By taking 1 cm to represent 3 m show the above information in a scale diagram.

(ii) By using the scale diagram find the actual distance between foot of the building and the point '*C*'.

5. (*a*) Simplify. $\frac{5}{2(x-1)} - \frac{2}{x-1} = 1\frac{1}{2}$

(*b*) If Prasadi spends $\frac{1}{2}$ of the money she has and Vinuki spends $\frac{1}{3}$ of money she has inorder to buy cloths the total amount of money they spend on cloths will be Rs. 22 000. If Prasadi and Vinuki spend $\frac{1}{4}$ and $\frac{1}{5}$ of the money respectively then they will spend only Rs. 12 000 on cloths.

(i) By taking the money with Prasadi as Rs. *x,* and money with Vinuki as Rs. *y,* build up a pair of simultaneous equations.

(ii) By solving the above pair of simultaneous equations find the amount of money that is there with Prasadi and Vinuki seperately.

6. The following frequency distribution is prepared using the information on the ages of the Acadamic staff of a certain school. (In the class interval 30 – 35 means greater than 30 and less than 35.)

Age (years)	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60
No of teachers (frequency)	2	5	16	20	4	3

(i) Find the modal class.

(ii) By taking the mid value of the modal class as the assumed mean find the mean age of a teacher to the nearest whole number.

(iii) To which age group 14% of teachers belongs to?

[See page three

Part B

* Answer **five** questions only.

7. (*a*) In the arithmetic progression –18, –11, –4, 3, …

(i) Find the 16^{th} term.

(ii) Find the sum of first 12 terms.

(*b*) (i) Show that there are two geometric progressions in which third term is 486 and fifth term is 54.

(ii) Write the first three terms of each geometric Progression.

8. By using the straight edge with the scale cm/mm and the pair of compasses and showing the construction lines clearly do the following constructions.

(i) Construct the triangle *ABD* such that, $AB = 8$ cm, $AD = 6$ cm, $A\hat{D}B = 90^{o}$
(Hint *:* use "Angle in a semi-circle is a right angle.)

(ii) Without measuring the length show that $BD = 2\sqrt{7}$.

(iii) By measuring *BD* length find the value of $\sqrt{7}$.

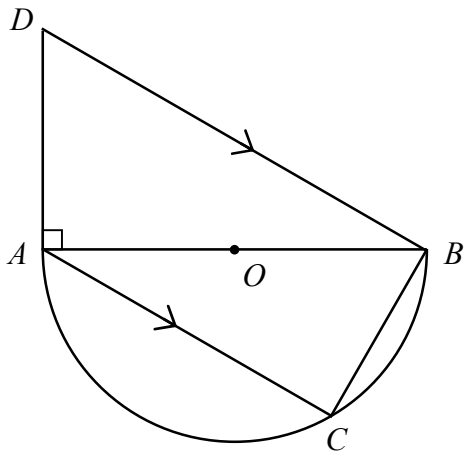
(iv) Draw a perpendicular from *D* to *AB* and name it as *DF*. Extended *DF* straight line meets the circle at *X*. Name an angle equals to $A\hat{D}F$ with reasons.

9. *AB* is a diameter of a circle with the centre *O*. C is a point on the circumference. $B\hat{A}D = 90°$, *AC*//*DB* .

(i) Show that *ABD* and *ACB* are equi – angular triangles.

(ii) If the radius of the circle is *r*. Prove that $4r^2 = AC \bullet BD$.

(iii) If $AC = 12$ cm and $BD = 16$ cm show that, $r = 4\sqrt{3}$.



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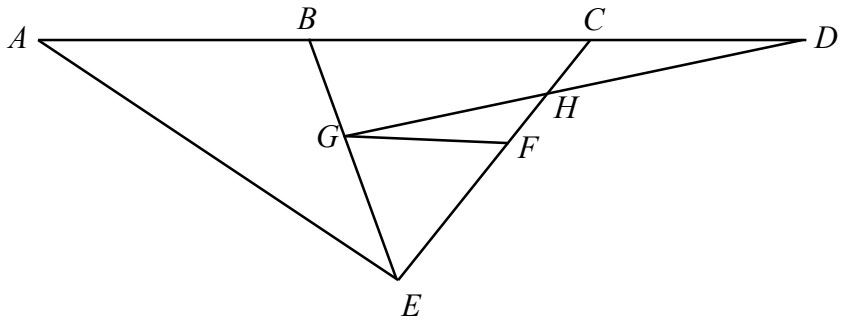
10.



In the triangle ABE, $AB = BE$ and G is the mid point of the side BE. The triangle BCE is drawn such that $BE = BC$. The side BC is produced up to D and $GE = CD$, also it is given that GF // BC.

Prove that,

(i) $\Delta\, CDH \equiv \Delta\, GFH$.

(ii) $CH = \frac{1}{4} CE$.

(iii) $A\hat{E}C = 90°$.

11. (*a*) A and B are two sets.

If $n(A) = 53$, $n(B) = 69$ and $n(A \cup B) = 113$ find $n(A \cap B)$.

(*b*) If ε = { Counting numbers from 1 to 10 }

A = $\{x : x$ is a triangular number. $1 \leq x \leq 10\}$

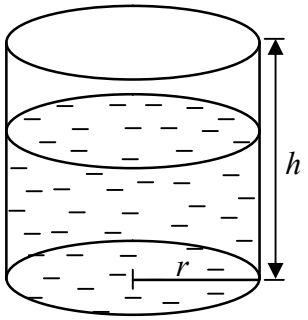
B = $\{x : x$ is a composite number. $1 \leq x \leq 10\}$

(i) Write the elements of all the above sets

(ii) Include the above information in a suitable Venn diagram.

(iii) Write the elements of the set $A' \cap B$.

12. $\frac{3}{4}$ of the height of cylinder is filled with water whose radius is r and height is h. When 12 sphers of diameter 'a' each put into the above cylinder then the water level reaches it's maximum height.



(i) Show that $a = \frac{\sqrt[3]{r^2 h}}{2}$.

(ii) If $r = 0.0965$ and $h = 11.03$ by using the tables of logarithms, find the diameter of a sphere to the nearest whole number.

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සතර

පෙර පාසලේ සිට උසස් පෙළ දක්වා සියළුම ප්‍රශ්න පත්‍ර,
කෙටි සටහන්, වැඩ පොත්, අතිරේක කියවීම් පොත්, සඟරා

සිංහල සහ ඉංග්‍රීසි මාධ්‍යයෙන් ගෙදරටම ගෙන්වා ගැනීමට

www.LOL.lk වෙබ් අඩවිය වෙත යන්න