| Education Zone - Negombo<br>Second Term Evaluation - 2016<br>Mathematics - I | | |
|---|---|---|
| Index No: ................................................... | | |
| Grade 11 | Paper I | 2 Hours |

* Answer all the questions on this paper itself.
* Each question in Part A carries 2 marks.
* Each question in Part B carries 10 marks.

## Part A

01. Express $\dfrac{5}{11}$ as a decimal and write it in concise form.

02. Simplify $\overline{1}.9420 \div 2$

03. Find the value of $\sqrt[4]{81} \times \dfrac{1}{\sqrt{9}}$

04. Write the set of integers belonging to the range of $-3 \leqslant x \leqslant +3$.

05. Express $3\sqrt{2}$ as an entire surd.

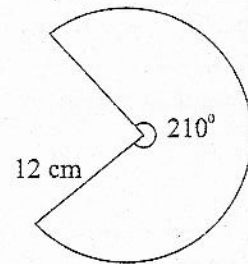06. Find the value of $15^3 - 3 \times 15^2 \times 8 + 3 \times 15 \times 8^2 - 8^3$ by writing as a cube of a binomial expression.

07. Simpify

$$\frac{x+2}{x^2-4} + \frac{1}{x+2}$$

08. Find the amount of interest that a person should pay for one year for borrowing Rs. 9 000 at 5% annual simple interest rate.

09. Find the radius of the base of the cone, which can be made using the sector which has been cut from a sheet as shown in the figure.
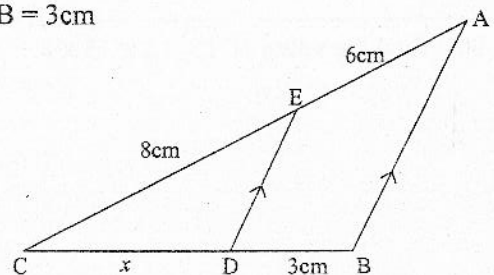


210°
12 cm

10. Vishva bought 600 shares at Rs. 100 per share in a company which pays an annual dividend of Rs. 4 per share. Find the annual dividends income he gains for this investment.

11. Find the $7^{th}$ term of the following progression.
0.6, 0.36, 0.216, ...........................

12. In the triangle ABC, AB//DE, AE = 6cm, CE = 8cm, and DB = 3cm
Find the value of $x$.



A
6cm
E
8cm
C   $x$   D   3cm   B

13. The ages (in years) of 11 candidates who have passed a competitive test are given below.

46, 47, 27, 50, 34, 30, 40, 35, 41, 42, 44

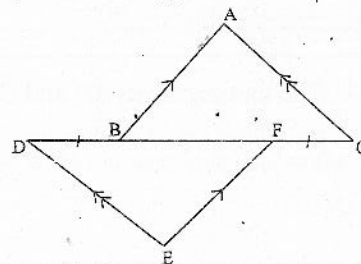Find the inter quartile range of it.

14. An aeroplane which is flying with a uniform speed, travels 1800 km within 6 hours. Calculate the speed of the aeroplane.

15. Find the actual distance in km which is represented by 10 cm on a map which is drawn to the scale 1 : 50 000.
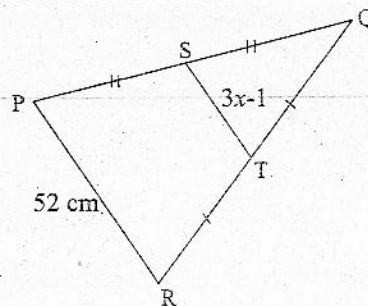
16. Factorise $x^2 - 8x + 15$

17. If AB//EF, AC//DE and DB = FC, write down the case of congruency of the triangles ABC and DEF.



18. Solve the quadratic equation $x^2 - 9 = 0$

19. Simplify $\dfrac{x^2 - y^2}{x^2 - 2xy + y^2} \times \dfrac{2x - 2y}{x^2 + xy^2}$
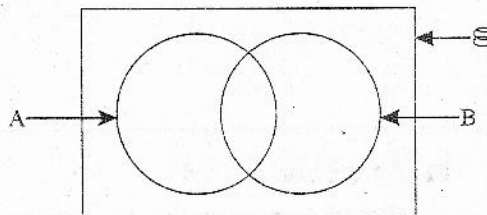
20. In the figure, PR = 52 cm and ST = $3x-1$. Find the value of $x$.

21. The ratio of the three angles of a triangle is 1 : 1 : 2
    (i) What is the magnitude of the smallest angle?
    (ii) What type of triangle is it?

22. Shade the relevant region for A′∩B on the Venn diagram given below.
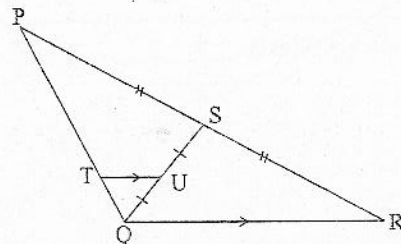
23. If the events x and y are independent events and $P(x) = \dfrac{1}{2}$ and $P(X \cap Y) = \dfrac{1}{5}$, find the value of P(Y)

24. The line segments AB and CD intersect at point E. Draw a rough sketch to show the locus of points travelling equidistant to the lines AB and CD.
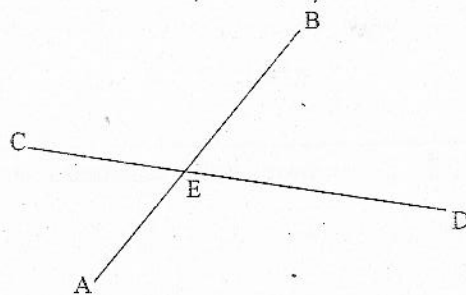
25. In the given figure PS = SR, SU = UQ and TU//QR. If QR = 24cm, find the length of TU.

(2 x 25 =50 Marks)

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## Part B

Answer all the questions on the paper itself.

01. A father sold $\frac{1}{3}$ of the land that he owned. $\frac{1}{4}$ of the remaining was kept for him. while the remaining was divided equally between the two children.

(i) What fraction from the total land remained after selling?    (02 Marks)

(ii) What fraction from the total land was kept for him?    (03 Marks)

(iii) What fraction from the total land was received by one child?    (03 Marks)

(iv) If the portion of land received by one child is 5 acres, find the total amount of the whole land in acres.    (02 Marks)

02. A trapezium shaped iron sheet is shown in the figure. The total area of the sheet is 5280cm². A semi-circular portion has been removed from it.

(i) What is the radius of the semi-circle?    (01 Mark)

120 cm

(ii) Find the area of the semi-circle.    (02 Marks)

56 cm
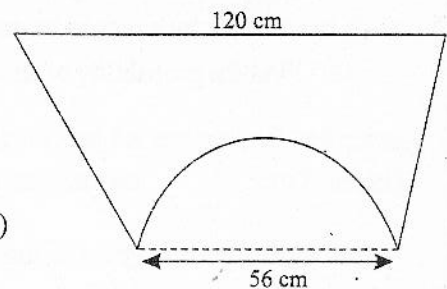
(iii) A circular window should be made using two such sheets which were cut as above. Show the prepared window using a rough sketch with the measurements.    (02 Marks)

(iv) Find the remaining area of the sheets after making the window.    (02 Marks)

(v) Find the perpendicular distance between the parallel sides of the frame.    (03 Marks)

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03. A particular plaster is made by mixing cement and sand to the ratio 1 : 6.

    (i)   What is the fraction of cement such a mixture contains?        (02 Marks)

    (ii)  How many pans of cement should be added to 24 pans of sand?        (02 Marks)

    (iii) A bag of cement consists of 5 pans of cement. A plaster should be made using a half of cement in such a bag. For that, how many pans of sand should be added?        (02 Marks)

    (iv) To prepare 35 pans of mixture of plaster, how many pans of cement and sand should be mixed together?        (04 Marks)

04. The probability of getting diabetes of an elder who is above 40 years is $\frac{4}{10}$ . The probability of getting a heart attack by a person having diabetes is $\frac{4}{5}$. According to the data given,

    (i)   Find the probability of an elder not being a diabetic patient.        (02 Marks)

    (ii)  Draw a tree diagram to show the events that a person being or not being a diabetic person.        (04 Marks)

    (iii) Extend the tree diagram that you have drawn to represent the events of getting or not getting a heart attack by a diabetic person.        (02 Marks)

    (iv) Eventhough being a diabetic patient, find the probability of he or she not being a heart patient.        (02 Marks)

05. The following table shows the way of spending the time of a certain day by a student.

| Task | Number of hours spent |
|---|---|
| Educational activities | 10 |
| sports activities | 5 |
| watching television | 1 |
| sleeping | 8 |

(i)   Calculate the angles of the sectors relevant to each task.                    (04 Marks)

(ii)  Represent the above information by using a pie chart.                    (04 Marks)

(iii) If he decided to spend the time allocated for watching television also for educational activities, write two changes that would take place in the pie chart you have drawn.          (02 Marks)

| | Education Zone - Negombo |
| | Second Term Evaluation - 2016 |
| | Mathematics - II |

| Index No.: ............................................ | | |
| Grade 11 | Paper II | Time: 3 Hours |

**Instructions:**
- Answer 10 questions selecting 5 questions from Part A and 5 questions from Part B.
- Each question carries 10 marks.
- The volume of a rigid circular cone of radius **r** and height **h** is $\frac{1}{3}\pi r^2 h$
- The volume of a sphere of radius **r** is $\frac{4}{3}\pi r^3$.

## Part A

01. Mr. Perera has borrowed Rs. 50 000 as a loan to be paid back in 10 equal monthly instalments. One monthly instalment is Rs. 5275.

    (i) Find the portion of the loan that should be paid for one month.    (02 Marks)
    (ii) Find the total amount paid in instalments.    (02 Marks)
    (iii) Find the total interest that should be paid.    (02 Marks)
    (iv) Calculate the number of month units.    (02 Marks)
    (v) Find the annual interest rate.    (02 Marks)

02. An incomplete table of sevaral values of $x$ and corresponding values of the function $y = x^2 - 4x + 1$ is given below.

| $x$ | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
|-----|----|----|----|----|----|----|----|
| $y$ | ...... | 1 | -2 | ...... | -2 | 1 | 6 |

    (a) (i) Find the corresponding values of $y$ when $x = -1$ and $x = 2$.    (02 Marks)
        (ii) Using a suitable scale, draw the graph for the above function.    (03 Marks)

    (b) Using the above graph,
        (i) Find the roots of the equation: $x^2 - 4x + 1 = 0$    (02 Marks)
        (ii) Write the range of $x$ values for which the function is negative.    (01 Mark)
        (iii) Write the above function in the form of $y = (x - a)^2 + b$ and find the values of $a$ and b.    (02 Marks)

03. Solve.

    (a) $\frac{3}{5}x + \frac{1}{3}y = 3$

       $\frac{1}{2}x - \frac{1}{3}y = 8$    (04 Marks)

    (b) The price of a pomegranate in a particular fruit stall is 50 rupees more than that of an orange. If Rs. 200 is required to buy 2 pomegranates and 3 oranges,

        (i) Build a pair of simultaneous equations by taking the price of a pomegranate as Rs. $x$ and the price of an orange as Rs. y.    (02 Marks)

        (ii) By solving it, find the price of a pomegranate and the price of an orange.    (04 Marks)

04. The top of a tower, which lies on a horizontal ground is D. A peron at the bottom of a building on the ground, observes the point D at an angle of elevation of $60^0$. When the top D is observed at a point B which is located 7m straightly above the point A, the angle of elevation is $30^0$.

By using a suitable scale drawing, (10 Marks)

   (a) Find the distance between the point A and the point C which is at the bottom of the tower.

   (b) Find the height of the tower.

05. The following frequency distribution shows the number of electricity units consumed within the range of 30 - 60 by 50 homes in a particular village. The data were obtained from the electricity bills.

(The class interval 32-36 represents $32 < x \leqslant 36$)

| Number of electricity units (Class interval) | Number of homes (f) |
|---|---|
| 32 - 36 | 3 |
| 36 - 40 | 5 |
| 40 - 44 | 10 |
| 44 - 48 | 12 |
| 48 - 52 | 8 |
| 52 - 56 | 7 |
| 56 - 60 | 5 |

   (i) What is the class interval of the number of electricity units used in the bills by most of the homes? (01 Mark)

   (ii) According to the data given, prepare a table including the columns $x$ (mid values) and $fx$ (03 Marks)

   (iii) According to the table, calculate the mean electricity units consumed by a home approximately to the unit. (whole number) (03 Marks)

   (iv) The fixed fee for every bill is Rs. 90. When the number of electricity units consumed lies within the range of 30 -60, Rs. 7.85 is charged per unit. Find the total income collected from the bills of 50 homes. (03 Marks)

06. In the right angled triangle ABC, $\stackrel{\wedge}{ABC} = 90^0$. Using your knowledge of equations, find the value of $x$ by completing the square or by using the quadratic formula.

($\sqrt{34} = 5.8$) (10 Marks)
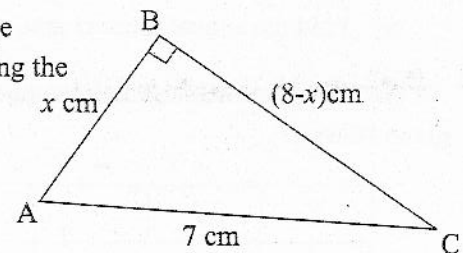


## Part B

07. (i) Prove that the sum of n terms (Sn) of the progression 3, 5, 7, ..... is given by $Sn = n^2+2n$. (04 marks)

   (ii) How many terms should be there from the first term for the sum to be equal to 120? (06 Marks)

08. (i) Construct the triangle ABC where AB = 7cm, BC = 5cm and ABC = $90^0$. (04 Marks)

   (ii) Measure the length of AC. (01 Mark)

   (iii) Write the relationship among AB, BC and AC. (01 Mark)

   (iv) By using it, obtain an approximate value for $\sqrt{74}$. (03 Marks)

   (v) Draw a parallel line to BC through A and complete the rectangle ABCD. (01 Mark)

09. In the triangle ABC, the points P and R lie on AB such that AP = BR. The point Q lies on AC such that PQ//BC and the point X lies on BC such that RX//AC.

   (i) Copy the figure given on to your answer sheet and mark the data given above. (02 Marks)

   (ii) Prove that $\triangle APQ \equiv \triangle BRX$ (03 Marks)

   (iii) show that ARXQ is a parallelogram, (02 Marks)

   (iv) If $\stackrel{\wedge}{PAQ} = 70^0$ and $\stackrel{\wedge}{QXC} = 50^0$, find the magnitude of $\stackrel{\wedge}{ACB}$. (03 Marks)
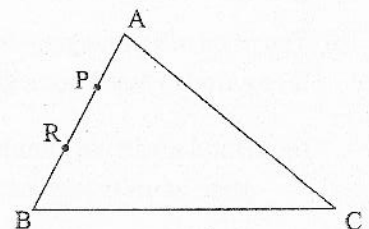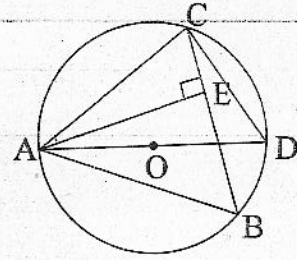
10. AD is a diameter of the circle. AE⊥BC. Prove that the triangles ACD and ABE are equi-angular.
By using it verify that,                                    (10 Marks)

$$\frac{AC}{AE} = \frac{AD}{AB}$$

11. the figure shows a glass vessel which has a shape of a cone. The radius of the cone is $2a$ centimetres and the height is $3a$ centimetres.

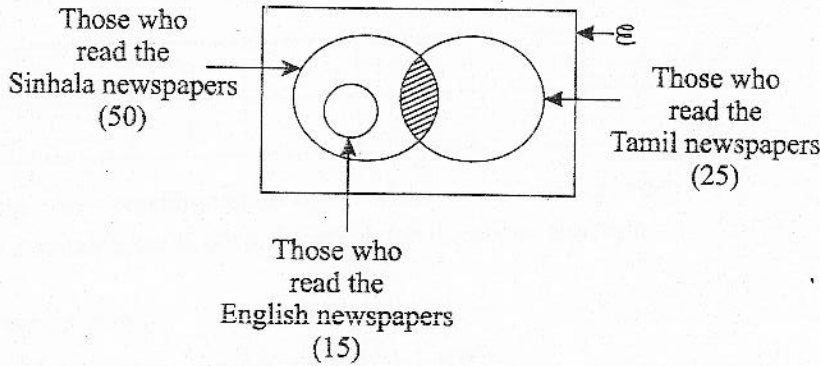(i) Show that the volume of water required to fill this vessel completely is given by $4\pi a^3$                                    (03 Marks)

(ii) When a solid sphere is carefully inserted into this vessel which is filled completely with water, some amount of water is displaced. Show that the remaining volume of water in the vessel can be obtained by $\frac{8}{3} \pi a^3$
(03 Marks)
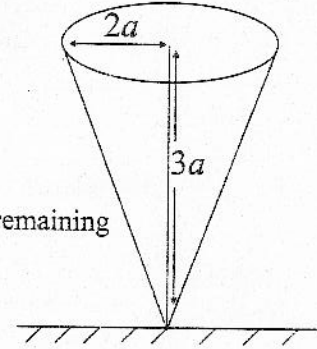
(iii) If $a = 2.5$, calculate the volume of water remaining in the vessel by using logarithmic tables. ($\pi = 3.14$)
(04 Marks)

12. The following Venn diagram shows the information about a group of people who went to a library.

Those who read the Sinhala newspapers (50)

Those who read the Tamil newspapers (25)

Those who read the English newspapers (15)

(i) Write the set belonging to the shaded region in your words.                    (02 Marks)
(ii) How many of them read both Sinhala and English newspapers?                    (02 Marks)
(iii) If 12 of them belong to the shaded region, how many of them read Sinhala newspapers only?
· (02 Marks)
(iv) If the number of people who did not read newspapers is 2, find the probability of a person who reads only one newspaper when selecting randomly.
(04 Marks)

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