Mid Year Examination 2015
Mathematics

Grade 10   ගණිතය   Time: 2.30 hours
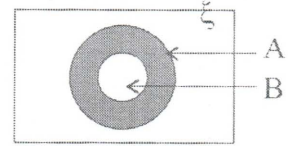
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● Answer all questions.   **Paper - I**

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01 A price of 3 mangoes equal to the price of 4 oranges. If the price of 4 oranges is Rs. 60, find the price of a mango.

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02 Write the shaded area in set notation.

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03 Write the L.C.M. of the following expression. $2x^2y^2$, $6xy^2$, $3x^2y$

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04 Write two properties of a parllelogram.

05 If $\log_a x = 0.1718$ $\log_a y = 1.0492$ find the value of $\log_a (xy)$.

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06 When Rs. 500 is given at 15% simple interest how much is the interest obtained after year ?

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07 Solve the equation $3x + 5 = 8$

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08 A water tank of $500l$ capacity can be completely filled in 16 minutes and 40 seconds by a pipe. Find the flow rate of the pipe.

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09 Make u as the subject of the formula $V^2 = u^2 + 2as$

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10	Simplify. $\dfrac{x}{x-a} + \dfrac{a}{a-x}$
11	If $n(\xi) = 74$, $n(A) = 45$, $n(B) = 38$ and $n(A \cup B) = 81$ find $n(A \cap B)$.
12	Write the gradient and the intercept of the line $y = 4x - 3$
13	The price of a dozen of exercise books is Rs. x and 5 pens is Rs. y. Write the price of a pen and 5 exercise books in terms of x and y.
14	If $y = \dfrac{3x}{\sqrt{a}}$ find the value of "a" when $x = 2$ and $y = 1$.
15	If $10^{1.5706} = 37.16$ find the value of antilog 0.5706
16	When a consumer buys goods worth is Rs. 3250 from a shop. 15% percentage of vat should be paid. What is the total amount that should be paid for it ?
17	In the following diagram, find the angles denoted by simple letters a and b.
18	If $2y - 3x = 4$, $3x + 1 = 3$ find the value of y.
19	By examining the function $y = x^2 - 5$ and find the coordinate of the turning point.
20	The ratio of the amounts of money P and Q have is $3 : 2$ and the ratio of the amounts of money Q and R have is $3 : 2$. Find the ratio of the amount of money P, Q and R have.
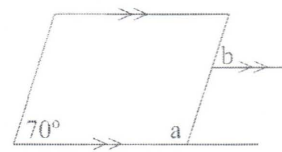
$(2 \times 20 = 40)$

Paper - II

- **Answer first question and four other questions. 16 marks in first question and 11 marks in each other questions.**

01 (a) A graph of an equation of the form $y = mx + c$ is shown in the figure below.

   (i) What is the value of c ?

   (ii) What is the value of m ?

   (iii) Write the equation of the straight line.
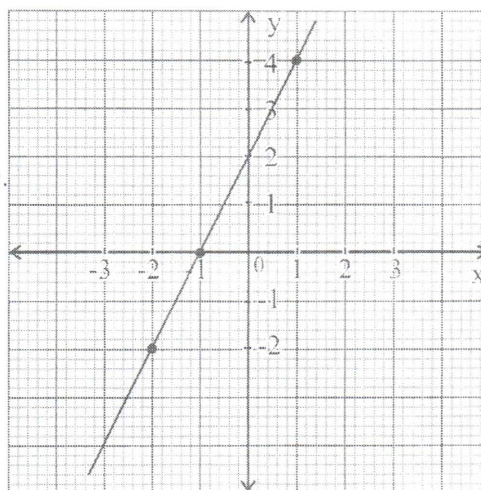
   (b) (i) Prepare a table of values with $-3 \leqslant x \leqslant +3$ to draw the graph of $y = -x^2 + 2$

   (ii) Draw the graph $y = -x^2 + 2$

   (iii) Using the graph

   1. Write the equation of the axis of symmetry of the graph.

   2. Write the coordinate of the turning point.

   3. Find the maximum or minimum value of the function.

   4. Find the roots of $-x^2 + 2 = 0$

02 (a) Out of 200 grade 11 students in a certain school 160 have passed Mathematics. 150 have passed Science and 10 have not passed any of the two subjects.

   (i) Represent the above data in a venn diagram.

   (ii) Find the number of students

   1. who have passed both Mathematics and Science.

   2. who have passed only Mathematics.

   3. who have passed only Science.

   (b) If a cycle traveled with a speed of $5ms^{-1}$ in the first 10 s and with a $10ms^{-1}$ in the next 40 s.

   Find the (i) distance travelled in the first 10 s.

   (ii) distance travelled in the next 40 s.

   (iii) total distance travelled.

   (iv) total time taken.

   (v) average speed.

03 (a) Simplify using the laws of logarithms and find the value of x.

$\log_2 2 + \log_2 (x + 1) = \log_2 4 + \log_2 3$

(b) Simplify using the logarithms table. $\dfrac{2.38 \times 75.43}{13.85}$

04 (a) Solve the equation. $\dfrac{x + 5}{3} + \dfrac{x + 2}{2} = 11$

(b) The sum of two numbers is equal to five times of there difference. Three times the larger number is greater than four times the smaller number by one.

(i) Taking the large number as x and smaller number as y and form two equations which include x and y.

(ii) Solve the equations and find the two numbers.

05 In the parallelogram ABCD. The bisector of the angle $D\hat{A}B$ meets DC at y and the bisector of the angle $D\hat{C}B$ meets AB at x.

(i) Denote these data in a diagram.

(ii) Prove that (a) Dy = Bx

(b) Ay = Cx

(c) AxCy is a parallelogram.

(d) AB is produced to E such that AB = BE prove that BDCE is a parallelogram.

06 (i) Factorise $8x^2 - 42x - 11$

(ii) Solve the equation $8x^2 - 42x - 11 = 0$

(iii) Simplify $\dfrac{5}{4x + 3} + \dfrac{3}{2x - 1} - \dfrac{1}{2}$

07 (a) Chandrasiri obtains a loan of Rs. 240000 under 15% simple interest per year.

(i) Calculate the interest he has to pay for the year.

(ii) Calculate the interest he has to pay for three years.

(iii) What is the amount he has to pay to get released from the loan after three years.

(b) Nimali pays Rs. 4500 for a quater as the assessment tax for his property to the Ppradesiya Sabha. If the assesed value of the property is Rs. 1200000

(i) Find the amount of assessment tax to be paid for a year.

(ii) Find the percentage of the assessment rate charged by this Pradesiya Sabha.