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GRADE 12

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**m<uq jdr mÍCIKh - 2020**

**First Term Examination - 2020**

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**COMBINED MATHS – I**

**Answer all the questions of Part A and any five questions of Part B.**

**Part -A**

01. Using the principle of Mathematical induction prove that 8n – 3n is divisible by 5, for all

02. If and are the roots of the equation 2*x*2 - 5*x* - 6 = 0. Find the value of |

03. Solve : < -2

04. Evaluate

lim

*x* 0

05. If , Y = + then show that,

=

Hence, find

06. Sketch the graphs of y = tan *x* and y = cos *x* in the same diagram for Find the area which is bounded by the two curves and the

07. The line joining the points A (10 , 0) and B (0 , 5) is the perpendicular bisector of the line which joining the point C (1 , 2) and D (3 , 6) Show that area of ACBD is 25 square units.

08. Let P = (1 , 2) and Q = (7 , 10). Find the equation of the circle S = 0. Where PQ, as a diameter. Let S = S + (4x – 3y +2) = 0 be a circle where . Show that P and Q lie on S1 = 0 also find the value of for which the circle S1 = 0 passing through R (1 , 4).

09. By using show that tan . Hence find the value of

tan

10. If , . If and , then find the value of

**Part - B**

11. (a). and are the roots of the equation where Express and in terms of a, b and c also obtain that, = Find the relationship in terms of a,b and c such that the value of lies between and

(b). If x be real, show that lies between and 3

(c). Let .

is a factor of and when is divided by the remainder is -20. Find the values of a and b.

Also find the remainder when is divided by .

12. (a). Let Ur = for r z+ and

f = Where .

Find and such that,

Ur = f – f

For , then show that

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Prove that is convergent

(b). Draw the graph of y = 4 - | 2*x* – 3 | and

y = 3 | *x* | -6 in the same figure

Hence find the set of real values

Of x satisfying 10 > 3 | *x* | + |

13. (a). Find the domain and the range of the following functions.

i. f = ii. h = iii. g =

iv. f =

(b). Let f = , . Find theinverse function of f(*x*). Also write down the domain of f -1.

(c). Let f = .

Find the values of

Such that Can be written as .

14. (a). If Then show that =

(b). Let ,

i. Show that

ii. Given that , where is the second derivation of . Find the turning points and asymptotes, of the function .

Using the first derivative, find the nature of the turning points.

Also find the point of infixion and sketch the graph of y =

15. (a). Integrate

(b) . By using an appropriate substation evaluate the integral

(c). By using integration by parts show that

Hence evaluate

16. (a). ABCD is a rhombus and the equation of diagonal AC is , Let B = (3, 1) and equation of CD is , where . Find the value of K and the equation of BC.

(b). The equations of the Circles C1 and C2 are and respectively sketch the diagrams of C1 and C2 indicating the point of contact clearly. The circle S3 touches C1 internally and C2 circle externally. Show that the centre of the circle C3 is the curve.

17. (a). Express in the form

, where a and b are real

Constants to be determined.

Hence,

i. Draw the graph of

ii. Solve the equation

(b). In the usual notation in the triangle ABC, . Show that *a*b = c2

(c). Solve the equation, + =