	RAVI MATHS TUITION CENTER ,GKM COLONY, CH- 82. PH: 8056206308
	unit 3 Theory of Equations - full test Date : 26- Jun-19
	12th Standard 2019 EM
	Maths Reg.No. :
Tir	ne : 02:00:00 Hrs Total Marks : 75
FO	R ANSWERS WHATSAPP - 8056206308 10 x 1 = 10
1)	If f and g are polynomials of degrees m and n respectively, and if $h(x) = (f 0 g)(x)$, then the degree of h is (a) mn (b) m+n (c) m ⁿ (d) n ^m
2)	The number of real numbers in [0,2π] satisfying sin⁴x-2sin²x+1 is
	(a) 2 (b) 4 (c) 1 (d) °
3)	If x ³ +12x ² +10ax+1999 definitely has a positive root, if and only if
	(a) $a \ge 0$ (b) $a > 0$ (c) $a < 0$ (d) $a \le 0$
4)	The quadratic equation whose roots are \propto and β is
	(a) $(\mathbf{x} - \alpha)(\mathbf{x} - \beta) = 0$ (b) $(\mathbf{x} - \alpha)(\mathbf{x} + \beta) = 0$ (c) $\alpha + \beta = \frac{b}{a}$ (d) $\alpha \cdot \beta = \frac{-c}{a}$
5)	If x is real and $\frac{x^2-x+1}{x^2+x+1}$ then
	(a) $\frac{1}{3} \le k \le$ (b) $k \ge 5$ (c) $k \le 0$ (d) none
6)	The equation $\sqrt{x+1}-\sqrt{x-1}=\sqrt{4x-1}$ has
	(a) no solution (b) one solution (c) two solution (d) more than one solution
7)	For real x, the equation $\left rac{x}{x-1} ight +\left x ight =rac{x^2}{\left x-1 ight }$ has
8)	(a) one solution (b) two solution (c) at least two solution (d) no solution If $(2+\tilde{A}3)x^2-2x+1+(2-\tilde{A}3)x^2-2x-1=\frac{2}{2-\sqrt{3}}$ then x= (a) 0,2 (b) 0,1 (c) 0,3 (d) 0, $\tilde{A}3$
9)	If \propto , β , γ are the roots of 9x3-7x+6=0, then $\propto \beta \gamma$ is
	(a) $\frac{-7}{9}$ (b) $\frac{7}{9}$ (c) 0 (d) $\frac{-2}{3}$
10)	If $p(x) = ax^2 + bx + c$ and $Q(x) = -ax^2 + dx + c$ where $ac - 0$ then $p(x)$. $Q(x) = 0$ has at least real roots.
	(a) no (b) 1 (c) 2 (d) infinite
	10 x 2 = 20
11)	Solve the equation 3x ² -16x ² +23x-6=0 if the product of two roots is 1.
12)	Solve the equation x ³ –9x ² +14x+24=0 if it is given that two of its roots are in the
	ratio 3:2.
13	Find a polynomial equation of minimum degree with rational coefficients, having $\sqrt{5}$ – $\sqrt{3}$ as a root.
14	Solve: (2x-1)(x+3)(x-2)(2x+3)+20=0
15	Solve the following equations,
1.0	$\sin^2 x - 5\sin x + 4 = 0$
1-) 10)	Solve: $8x^{2x} - 8x^{2x} = 63$
10	Find all real numbers satisfying $4^{x}-3(2^{x+2})+2^{3}=0$
18	Construct a cubic equation with roots 1,1, and -2
19)	If α , β and γ are the roots of the cubic equation x ³ +2x ² +3x+4=0, form a cubic equation whose roots are

-α, β, -γ

20)

Solve: (x-4)(x-7)(x-2)(x+1)=16

21) If α and β are the roots of the quadratic equation $2x^2-7x+13 = 0$, construct a quadratic equation whose roots are α^2 and β^2 .

5 x 3 = 15

6 x 5 = 30

- 22) If p is real, discuss the nature of the roots of the equation $4x^2+4px+p+2=0$ in terms of p.
- 23) If 2+i and 3- $\sqrt{2}$ are roots of the equation x⁶-13x⁵+62x⁴-126x³+65x²+127x-140=0, find all roots.
- 24) Find the roots of $2x^3+3x^2+2x+3$
- 25) Find solution, if any, of the equation 2cos²x-9cosx+4=0
- 26) Find a polynomial equation of minimum degree with rational coefficients, having 2- $\sqrt{3}$ i as a root.
- 27) Show that the equation $2x^2-6x+7=0$ cannot be satisfied by any real values of x.
- 28) If $x^2+2(k+2)x+9k=0$ has equal roots, find k.
- 29) Solve the equation (2x-)(6x-1)(3x-2)(x-12)-7=0
- 30) Discuss the nature of the roots of the following polynomials: $x^{2018}+1947x^{1950}+15x^{8}+26x^{6}+2019$
- 31) Solve: $(2x^2 3x + 1)(2x^2 + 5x + 1) = 9x^2$.



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Unit 3 Theory of Equations 2M

Date: 26-Jun-19

12th Standard 2019 EM Maths

Reg.No. :

Time: 00:30:00 Hrs

Total Marks : 30 15 x 2 = 30

- 1) If the sides of a cubic box are increased by 1, 2, 3 units respectively to form a cuboid, then the volume is increased by 52 cubic units. Find the volume of the cuboid.
- 2) Construct a cubic equation with roots 1,2, and 3
- 3) If α , β and γ are the roots of the cubic equation $x^3+2x^2+3x+4=0$, form a cubic equation whose roots are, 2α , 2β , 2γ
- 4) Solve the equation $3x^2-16x^2+23x-6=0$ if the product of two roots is 1.
- 5) Find the sum of squares of roots of the equation $2x^4-8x+6x^2-3=0$.
- 6) Solve the equation $x^3-9x^2+14x+24=0$ if it is given that two of its roots are in the ratio 3:2.
- 7) If α , β , and γ are the roots of the polynomial equation ax³+bx²+cx+d=0, find the value of $\sum \frac{\alpha}{\beta \gamma}$ in terms of the coefficients.
- 8) If α , β , γ and δ are the roots of the polynomial equation $2x^4+5x^3-7x^2+8=0$, find a quadratic equation with integer coefficients whose roots are $\alpha + \beta + \gamma + \delta$ and $\alpha\beta\delta\delta$.
- 9) If p and q are the roots of the equation $lx^{2}+nx+n=0$, show that $\sqrt{\frac{p}{q}} + \sqrt{\frac{q}{p}} + \sqrt{\frac{n}{l}} = 0$.
- 10) If the equations $x^2 + px + q = 0$ and $x^2 + p'x + q' = 0$ have a common root, show that it must be equal to $\frac{pq'-p'q}{q-q'}$ or $\frac{q-q'}{p'-p}$.
- 11) Formalate into a mathematical problem to find a number such that when its cube root is added to it, the result is 6.
- 12) A 12 metre tall tree was broken into two parts. It was found that the height of the part which was left standing was the cube root of the length of the part that was cut away. Formulate this into a mathematical problem to find the height of the part which was cut away.
- 13) If k is real, discuss the nature of the roots of the polynomial equation $2x^2+kx+k=0$, in terms of k.
- 14) Find a polynomial equation of minimum degree with rational coefficients, having $2+\sqrt{3}$ i as a root.
- 15) Find a polynomial equation of minimum degree with rational coefficients, having 2i+3 as a root.

RAVI MATHS TUITION CENTER, PH - 8056206308

Unit 3 Theory of Equations 2M test 2

Date: 26-Jun-19

12th Standard 2019 EM Maths

Reg.No. :

Total Marks : 20 10 x 2 = 20

Time: 00:25:00 Hrs

- 1) Solve: (2x-1)(x+3)(x-2)(2x+3)+20=0
- 2) Solve the cubic equation : $2x^3-x^2-18x+9=0$ if sum of two of its roots vanishes.
- 3) Solve the equation $3x^3-26x^2+52x-24=0$ if its roots form a geometric progression.
- Solve the cubic equations: 8x³-2x²-7x+3=0
- 5) Solve: $8x^{\frac{3}{2x}} 8x^{\frac{-3}{2x}} = 63$
- 6) Solve the equation $6x^4-5x^3-38x^2-5x+6=0$ if it is known that $\frac{1}{3}$ is a solution.
- 7) Find the exact number of real roots and imaginary of the equation $x^9+9x^7+7x^5+5x^3+3x$.
- 8) Examine for the rational roots of $x^8-3x+1=0$
- 9) Find value of a for which the sum of the squares of the equation $x^2 (a 2) x a 1 = 0$ assumes the least value.

¹⁰⁾ Find x If $x = \sqrt{2 + \sqrt{2 + \sqrt{2 + \ldots + upto\infty}}}$



RAVI MATHS TUITION CENTER, PH - 8056206308

Unit 3 Theory of Equations 3M test 3

Date : 26-Jun-19

12th Standard 2019 EM Maths

Reg.No. :

Time : 00:45:00 Hrs

Total Marks : 45 15 x 3 = 45

- 1) If α and β are the roots of the quadratic equation $17x^2+43x-73=0$, construct a quadratic equation whose roots are $\alpha + 2$ and $\beta + 2$.
- 2) If α and β are the roots of the quadratic equation $2x^2 7x + 13 = 0$, construct a quadratic equation whose roots are α^2 and β^2 .
- 3) If α , β , and γ are the roots of the equatio x³+pz²+qx+r=0, find the value of $\sum \frac{1}{\beta \gamma}$ in terms of the coefficients.
- 4) Find the sum of the squares of the roots of $ax^4+bx^3+cx^2+dx+e=0$.
- 5) If p is real, discuss the nature of the roots of the equation $4x^2+4px+p+2=0$ in terms of p.
- 6) If 2+i and 3- $\sqrt{2}$ are roots of the equation x⁶-13x⁵+62x⁴-126x³+65x²+127x-140=0, find all roots.
- 7) Obtain the condition that the roots of $x^3+px^2+qx+r=0$ are in A.P.
- 8) Find the condition that the roots of $ax^3+bx^2+cx+d=0$ are in geometric progression. Assume a,b,c,d -0.
- 9) If the roots of $x^3+px^2+qx+r=0$ are in H.P. prove that $9pqr = 27r^3+2p$.
- 10) It is known that the roots of the equation $x^3-6x^2-4x+24=0$ are in arithmetic progression. Find its roots.
- 11) Solve the equation $7x^3-43x^2=43x-7$
- 12) Find solution, if any, of the equation $2\cos^2 x 9\cos x + 4 = 0$
- 13) Find the number .of real solu, tlons of sin (e^x) -5^x + 5^{-x}
- 14) Solve:(x-1)⁴+(x-5)⁴=82
- 15) Solve: $(5 + 2\sqrt{6})^{x^2-3} + (5 2\sqrt{6})^{x^2-3} = 10$

	RAVI MATHS TUITION CENTER, PH - 8056206308 Unit 3 Theory of Equations 5M test 4 12th Standard 2019 EM	Date :	26-Jun-19	
	Maths	Reg.No. :		
Time : 01:30:00 Hrs Total Mark				
			12 x 5 = 60	
1)	Find the monic polynomial equation of minimum degree with real coefficients having	g 2- $\sqrt{3}$ i as a root.		
2)	Form a polynomial equation with integer coefficients with $\sqrt{rac{\sqrt{2}}{\sqrt{3}}}$ as a root.			
3)	If x ² +2(k+2)x+9k=0 has equal roots, find k.			
4)	Show that, if p,q,r are rational, the roots of the equation $x^2-2px+p^2-q^2+2qr-r^2=0$ are r	ational.		
5)	Prove that a line cannot intersect a circle at more than two points.			
6)	Solve the equation (x-2)(x-7)(x-3)(x+2)+19=0			
7)	Show that the polynomial 9x ⁹ +2x ⁵ -x ⁴ -7x ² +2 has at least six imaginary roots.			
8)	Discuss the nature of the roots of the following polynomials:			
	x ²⁰¹⁸ +1947x ¹⁹⁵⁰ +15x ⁸ +26x ⁶ +2019			
9)	If the sum of the roots of the quadratic equation $ax^{2}+bx+c=0$ (abe- 0) is equal to the	e sum of the squares of their		
	reciprocals, then $\frac{a}{c}$, $\frac{b}{a}$, $\frac{c}{b}$ are H.P.			
10) If c - 0 and $\frac{p}{2m} = \frac{a}{x+r} + \frac{b}{x-c}$ has two equal roots, then find p.				
11) If the equation $x^2 + bx + ca = 0$ and $x^2 + cx + ab = 0$ have a comnion root and b-c, then prove that their roots will satisfy the				
12)	equation $x^2 + ax + bc = 0$. Solve: $(2x^2 - 3x + 1)(2x^2 + 5x + 1) = 9x^2$.			

	RAVI MATHS TUITION CENTER, PH - 8056206308 Unit 3 Theory of Equations 1M test 5 Date : 26-Jun-19 12th Standard 2019 EM		
Tir	Maths Reg.No.: Total Marks : 25		
1)	23 x 1 = 23 A zero of x ³ + 64 is		
	(a) 0 (b) 4 (c) 4i (d) -4		
2)	If f and g are polynomials of degrees m and n respectively, and if $h(x) = (f 0 g)(x)$, then the degree of h is (a) mn (b) m+n (c) m ⁿ (d) n ^m		
3)	A polynomial equation in x of degree n always has		
	(a) n distinct roots (b) n real roots (c) n imaginary roots (d) at most one root		
4)	If α , β and γ are the roots of $x^3 + px^2 + qx + r$, then $\sum \frac{1}{\alpha}$ is (a) $-\frac{q}{2}$ (b) $\frac{p}{2}$ (c) $\frac{q}{2}$ (d) $-\frac{q}{2}$		
5)	According to the rational root theorem, which number is not possible rational root of $4x^7+2x^4-10x^3-5?$ (a) -1 (b) $\frac{5}{4}$ (c) $\frac{4}{5}$ (d) 5		
6)	The polynomial x ³ -5x ² +9x has three real roots if and only if, k satisfies		
	(a) $ \mathbf{k} \leq 6$ (b) $ \mathbf{k} > 6$ (d) $ \mathbf{k} \geq 6$		
7)	The number of real numbers in [0,2π] satisfying sin⁴x-2sin²x+1 is		
8) 9)	(a) 2 (b) 4 (c) 1 (d) $^{\circ}$ If x ³ +12x ² +10ax+1999 definitely has a positive root, if and only if (a) a ≥ 0 (b) a > 0 (c) a< 0 (d) a ≤ 0 The polynomial x ³ +2x+3 has		
	(a) one negative and two real roots (b) one positive and two imaginary roots (c) three real roots (d) no solution		
10)	$10)$ The number of positive roots of the polynomial $\sum\limits_{j=0}^n n_{C_r}$ (-1)'x' is		
	(a) 0 (b) n (c) $<$ n (d) r		
11)	The quadratic equation whose roots are \propto and β is		
	(a) $(\mathbf{x} - \mathbf{x})(\mathbf{x} - \beta) = 0$ (b) $(\mathbf{x} - \mathbf{x})(\mathbf{x} + \beta) = 0$ (c) $\mathbf{x} + \beta = \frac{\sigma}{a}$ (d) $\mathbf{x} \cdot \beta = \frac{\sigma}{a}$		
12	$If_j(x) = 0 has n roots, then f'(x) = 0 has roots$		
• • •	(a) n (b) n -1 (c) n+1 (d) (n-r)		
13	It x is real and $\frac{x+1}{x^2+x+1}$ then		
	(a) $\frac{1}{3} \leq k \leq$ (b) $k \geq 5$ (c) $k \leq 0$ (d) none		
14)	Let $a > 0$, $b > 0$, $c > 0$. h n both th root of th quatlon $ax^2+b+C=0$ are		
	(a) real and negative (b) real and positive (c) rational numb rs (d) none		
15)	The equation $\sqrt{x}+1-\sqrt{x}-1=\sqrt{4x}-1$ has		
	(a) no solution (b) one solution (c) two solution (d) more than one solution		
16)	If the root of the equation x ³ +bx ² +cx-1=0 form an Increasing G.P, then		
	(a) one of the roots is 2 (b) one of the rots is 1 (c) one of the rots is -1 (d) one of the rots is -2		

(a) one of the roots is 2 (b) one of the rots is 1 (c) 17) For real x, the equation $\left|\frac{x}{x-1}\right| + |x| = \frac{x^2}{|x-1|}$ has


