X – MATHS (reduced syllabus) 2021-2022

Self Evaluvation

Success = Sum of all efforts
Don't stop until you are success.
Use the mind not the mouth
- A.Balaiah
Tirunelveli(9750493961)

1.Relations and Functions:

PROPERTY	CARTESIAN PRODUCT
Commutative	A X B ≠ B X A
Associative	AX(BXC)=(AXB)XC
Distributive	$A\times(B\cap C)=(A\times B)\cap(A\times C)$

2.Sequences and Series

Euclids lemma : a=bq+r condition for r : $0 \le r < |b|$ Odd integer : 2k-1

Even integer: 2k+1 divides (the) : then Find HCF divisible by : then Find LCM

	A.P
GENERAL FORM	a, a+d ,a+2d , a+3d ,……
GENERAL TERM	t_n=a+(n-1)d
THREE CONSECTIVE TERMS/FOUR	a-d , a ,a+d / a -3d,a-d,a+d,a+3d
NUMBER OF TERMS	$n=\frac{l-a}{d}+1$
5 terms Temperature sum	a-d,a,a+d,a+2d,a+3d

3.ALGEBRA

Three digit number : 100x+10y+z Area of the rectangular path =outer area –inner area

Bus/Train sum: $T_1-T_2=\frac{1}{2}$ hr / T_1-T_2= 1 hr Flower bed sum :$3(10-2x)^2+4(100-(10-2x)^2)=364$

The pole sum : $x^2+y^2=20^2$

$(a+b)^2=(a+b)(a+b)$	$\alpha-\beta=\sqrt{(\alpha+\beta)^2-4\alpha\beta}$
$(a-b)^2=(a-b)(a-b)$	$\alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta$
$a^2-b^2=(a+b)(a-b)$	$\alpha^4+\beta^4=\alpha^{2^2}+\beta^{2^2}$
$(a+b+c)^2=$	$\alpha^3+\beta^3=(\alpha+\beta)^3-3\alpha\beta(\alpha+\beta)$
$a^3+b^3=(a+b)(a^2-ab+b^2)$	$\beta-\alpha=-(\alpha-\beta)$
$a^3-b^3=(a-b)(a^2+ab+b^2)$	$\alpha^3-\beta^3=(\alpha-\beta)^3+3\alpha\beta(\alpha-\beta)$
$a^4+a^2+1=(a^2+a+1)(a^2-a+1)$	$X^4+4x^2+16=(x^2+2x+4)(x^2-2x+4)$

sum of zeros (α + β) = $\frac{-b}{a}$ product of zeros (α β) = $\frac{c}{a}$

Formula for solving quadratic equation $= \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

Formation of quadratic polynomials : p(x)=x^2-(sum of zeros)x+product of zeros

Formation of quadratic equation : x^2 - (sum of roots)x + product of roots

For finding Nature of roots $\Delta = b^2 - 4ac$

If Δ > 0 ,roots are real and unequal

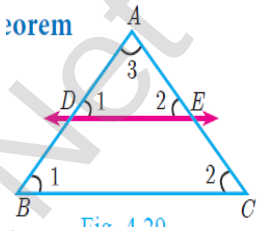
If Δ = 0 ,roots are real and equal

If Δ < 0 ,No real roots

4.Geometry

Write the statement ,To prove and Draw the diagram

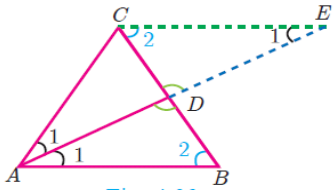
- **Thales Theorem**



Statement :A straight line drawn parallel to a side of triangle intersecting the other two sides, divides the sides in the same ratio.

To prove : $\frac{AD}{DB} = \frac{AE}{EC}$

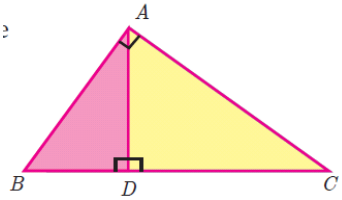
- **Angle Bisector Theorem**



Statement : The internal bisector of an angle of a triangle divides the opposite side internally in the ratio of the corresponding sides containing the angle.

To prove : $\frac{AB}{AC} = \frac{BD}{DC}$

- **Pythagoras Theorem**



Statement : In a right angle triangle, the square on the hypotenuse is equal to the sum of the squares on the other two sides.

To prove : $BC^2=AB^2+AC^2$

Height of the point of intersection of two pole = $\frac{ab}{a+b}$

5.Co-ordinate Geometry

The midpoint of the line segment : $(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2})$

When want to draw graph : To find Area

Area of a triangle : $\frac{1}{2}\begin{Bmatrix} x_1 & x_2 & x_3 & x_1 \\ y_1 & y_2 & y_3 & y_1 \end{Bmatrix} sq.units$

Area of the quadrilateral : $\frac{1}{2}\begin{Bmatrix} x_1 & x_2 & x_3 & x_4 & x_1 \\ y_1 & y_2 & y_3 & y_4 & y_1 \end{Bmatrix} sq.units$

Slope i. $m = \frac{y_2-y_1}{x_2-x_1}$ ii. $m = \frac{-\ coeff\ 0f\ x}{coeff\ of\ y}$ iii. $m = tan\theta$

y*-intercept *c : $\frac{-\ constant\ term}{coeff\ of\ y}$

To prove : Parallelogram (AB‖ CD $BC \parallel AD$) , Trapezium(AB‖ CD $BC \nparallel AD$) ,

Right angle triangle(m_1x m_2= -1) ,

Midpoints are parallelogram (four mid point , then(AB‖ CD $BC \parallel AD$))

Equation :

Equation of straight line in various forms

Form	Name	Form	Name
$ax+by+c=0$	General form	$\frac{x}{a}+\frac{y}{b}=1$	Intercept form
$y-y_1=m(x-x_1)$	Point-slope form	$x=c$	Parallel to Y axis
$y=mx+c$	Slope-intercept	$y=b$	Parallel to X axis
$\frac{y-y_1}{y_2-y_1}=\frac{x-x_1}{x_2-x_1}$	Two point form		

Steps for find the Equation :

Altitude : m_1 , m_2 ,equation **Median :** mid point ,equation **Perpendicular:** m_1 , m_2 , equation
Sum of intercepts 7 : a=a , b=7-a **Equal Intercepts :** a=k , b=k **Ratio 3:5 :** a=3k , b=5k

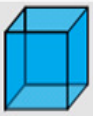
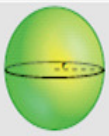
Equal and opposite sign : a=k , b= - k

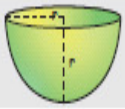
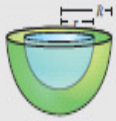
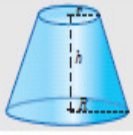
TRIGONOMETRY:

θ	0°	30°	45°	60°	90°
sin	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
tan	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	∞

7.MENSURATION

Points to Remember

Solid	Figure	Curved surface Area / Lateral surface Area (in sq. units)	Total surface Area (in sq. units)	Volume (in cubic units)
Cuboid		$2h(l+b)$	$2(lb+bh+lh)$	$l\times b\times h$
Cube		$4a^2$	$6a^2$	a^3
Right Circular Cylinder		$2\pi rh$	$2\pi r(h+r)$	πr^2h
Right Circular Cone		πrl $l=\sqrt{r^2+h^2}$ l = slant height	$\pi rl+\pi r^2$ $=\pi r(l+r)$	$\frac{1}{3}\pi r^2h$
Sphere		$4\pi r^2$	$4\pi r^2$	$\frac{4}{3}\pi r^3$

Hemisphere		$2\pi r^2$	$3\pi r^2$	$\frac{2}{3}\pi r^3$
Hollow Cylinder		$2\pi(R+r)h$	$2\pi(R+r)$ $(R-r+h)$	$\pi(R^2-r^2)h$
Hollow sphere		$4\pi R^2$ = outer surface area	$4\pi(R^2+r^2)$	$\frac{4}{3}\pi(R^3-r^3)$
Hollow Hemisphere		$2\pi(R^2+r^2)$	$\pi(3R^2+r^2)$	$\frac{2}{3}\pi(R^3-r^3)$
Frustum of right circular cone.		$\pi(R+r)l$ where $l=\sqrt{h^2+(R-r)^2}$	$\pi(R+r)l+\pi R^2$ $+\pi r^2$	$\frac{1}{3}\pi h\left[R^2+r^2+Rr\right]$

SHAPE	C.S.A	T.S.A(SA)	VOLUME(Capacity)
Jewel Box	——	$2(l+b)h_1 + lb + \frac{1}{2}(2\pi r h_2)$ sq.units	$lbh_1 + \frac{1}{2}(\pi r^2 h_2)$ cu. units
Hemisphere on Cube	-- -------	$5a^2 + 2\pi r^2 + a^2 - \pi r^2$ $= 6a^2 + \pi r^2$	--------

1litre= $\frac{1}{1000}$m^3 1litre= 1000 cm^3 1m = 100 cm 1km = 1000 m

1cm = 10 mm 14.64 m/s = 14.64 x $\frac{3600}{1000}$km/hr

Base area = πr^2 Base circumference = $2\pi r$

Cone $\ell = \sqrt{h^2 + r^2}$ h = $\sqrt{l^2 - r^2}$ r = $\sqrt{l^2 - h^2}$

Frustum $\ell = \sqrt{h^2 + (R-r)^2}$

8.STATISTICS AND PROBABILITY

- No of cards 52-
- Black card -26
- Red card -26
- Red king -2
- Black Queen -2
- Red diamond -13
- Red spade –0
- Face cards -12
- Number cards - 36

p($\bar{A} \cap B$) = $p(B) - p(A \cap B$ p($A \cap \bar{B}$) =$p(A) - p(A \cap B)$

P(A) + P($\bar{A}$) = 1 P($\bar{A}$) = 1 – p(A)

1.Tossing an unbiased coin twice S =$\{HH, HT, TH, TT\}$

2.Tossing an unbiased coin thrice

S = $\{HHH, HHT, HTH, HTT, THH, THT, TTH, TTT\}$

3.Sum as a prime number on tossing 2 dice:

$$\{(1,1),(1,2),(1,4),(1,6),(2,1),(2,3),(2,5),(3,2),(3,4),(4,1),(4,3),(5,2),(5,6),(6,1),(6,5)\}$$

4.Tossing 3 coin i) atleast 2 tail =$\{HTT, THT, TTH, TTT\}$

ii)2consecutive tail = $\{HTT, TTH, TTT\}$

iii) atmost 2 head = $\{HHT, HTH, HTT, THH, THT, TTH, TTT\}$

iv)In 1 to 1000 Perfect Square greater than 500 = {23^2……. 31^2}

_____ ALL THE BEST