DELHI WORLD PUBLIC SCHOOL
RAJKOT

Class: IX & X **Date:** 27.10.2022

9 5 0 7 2 3 6

Name:________________________________

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Sub: Mathematics

1. $sin^2\theta + cos^2\theta = 1$
2. $sin^2\theta = 1 - cos^2\theta$
3. $\sin\theta = \sqrt{1 - cos^2\theta}$
4. $cos^2\theta = 1 - sin^2\theta$
5. $\cos\theta = \sqrt{1 - sin^2\theta}$
6. $sec^2\theta - tan^2\theta = 1$
7. $sec^2\theta = 1 + tan^2\theta$
8. $sec\theta = \sqrt{1 + tan^2\theta}$
9. $tan^2\theta = sec^2\theta - 1$
10. $tan\theta = \sqrt{sec^2\theta - 1}$
11. $cosec^2\theta - cot^2\theta = 1$
12. $cosec^2\theta = 1 + cot^2\theta$
13. $cosec\theta = \sqrt{1 + cot^2\theta}$
14. $cot^2\theta = cosec^2\theta - 1$
15. $cot\theta = \sqrt{cosec^2\theta - 1}$
16. $sin\theta \times cosec\theta = 1$
17. $sin\theta = \frac{1}{cosec\theta}$
18. $cosec\theta = \frac{1}{sin\theta}$
19. $tan\theta \times cot\theta = 1$
20. $tan\theta = \frac{1}{cot\theta}$
21. $cot\theta = \frac{1}{tan\theta}$
22. $cos\theta \times sec\theta = 1$
23. $cos\theta = \frac{1}{sec\theta}$
24. $sec\theta = \frac{1}{cos\theta}$
25. $cot\theta = \frac{cos\theta}{sin\theta}$
26. $tan\theta = \frac{sin\theta}{cos\theta}$
27. $(1 + sin\theta)(1 - sin\theta) = cos^2\theta$
28. $\sqrt{(1 + sin\theta)(1 - sin\theta)} = cos\theta$
29. $\sqrt{(1 + cos\theta)(1 - cos\theta)} = sin\theta$
30. $\sin(90° - \theta) = cos\theta$
31. $\cos(90° - \theta) = sin\theta$
32. $\tan(90° - \theta) = cot\theta$
33. $\cot(90° - \theta) = tan\theta$
34. $\sec(90° - \theta) = cosec\theta$
35. $cosec(90° - \theta) = sec\theta$
36. $if\ \alpha\ and\ \beta\ are\ the\ zeros\ of\ p(x) = ax^2 + bx + c, a \neq 0\ then$
    i. $\alpha + \beta = \frac{-b}{a}$
    ii. $\alpha\beta = \frac{c}{a}$
37. $A\ quadratic\ polynomial\ whose\ zeros\ are\ \alpha\ and\ \beta\ is\ given\ by$
    $p(x) = \{x^2 - (\alpha + \beta)x + \alpha\beta\}.$
38. $if\ \alpha, \beta\ and\ \gamma\ the\ zeros\ of$ $p(x) = ax^3 + bx^2 + cx + d$ then
    i. $(\alpha + \beta + \gamma) = \frac{-b}{a}$
    ii. $\alpha\beta + \beta\gamma + \gamma\alpha = \frac{c}{a}$
    iii. $\alpha\beta\gamma = \frac{-d}{a}$
39. A cubic polynomial whose zeros are $\alpha, \beta\ and\ \gamma\ is\ given\ by$:
    $p(x) = \{x^3 - (\alpha + \beta + \gamma)x^2 + (\alpha\beta + \beta\gamma + \gamma\alpha)x - \alpha\beta\gamma\}$
40. $if\ Quadratic\ Equation\ ax^2 + bx + c = 0\ a \neq 0\ , then\ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
41. $t_n = a + (n - 1)d$
42. $s_n = \frac{n}{2}[2a + (n - 1)d]$
43. The distance between the points $A(x_1, y_2)\ and\ B(x_2, y_2) is\ given\ by$:
    $AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}.$
44. $If\ p(x, y) divides\ the\ join\ of\ A(x_1, y_1)\ and\ B(x_2, y_2) in\ the\ ratio\ m{:}n\ then$
    $$x = \frac{(mx_2 + nx_1)}{(m + n)}\ and\ y = \frac{(my_2 + ny_1)}{m + n}$$
45. $the\ midpoint\ of\ the\ join\ of\ A(x_1, y_1)\ and\ B(x_2, y_2)\ is\ given\ by\ M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right).$
46. Area of the ΔABC with vertices $A(x_1, y_1), B(x_2, y_2)\ and\ C(x_3, y_3) is\ given$
    $ar(\Delta ABC) = \frac{1}{2}|[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]|.$
47. $(a + b)^2 = a^2 + 2ab + b^2$
48. $(a - b)^2 = a^2 - 2ab + b^2$
49. $a^2 - b^2 = (a + b)(a - b)$
50. $(a + b)^2 - (a - b)^2 = 4ab$
51. $(a + b)^2 + (a - b)^2 = 2(a^2 + b^2)$
52. $\frac{a^2 - b^2}{a + b} = a - b$
53. $\frac{a^2 - b^2}{a - b} = a + b$
54. $a^2 + b^2 = (a + b)^2 - 2ab$
55. $a^2 + b^2 = (a - b)^2 + 2ab$
56. $(x + a)(x + b) = x^2 + (a + b)x + ab$
57. $(x - a)(x - b) = x^2 - (a + b)x + ab$
58. $(x - a)(x + b) = x^2 - (a - b)x - ab$
59. $(x - a)(x - b) = x^2 - (a + b)x + ab$

60. $(a+b+c)^2 = a^2+b^2+c^2+2ab+2bc+2ca$
61. $(a-b+c)^2 = a^2+b^2+c^2-2ab-2bc+2ca$
62. $(a+b-c)^2 = a^2+b^2+c^2+2ab-2bc-2ca$
63. $(a-b-c)^2 = a^2+b^2+c^2-2ab+2bc-2ca$
64. $(-a-b-c)^2 = a^2+b^2+c^2+2ab+2bc+2ca$
65. $(-a-b+c)^2 = a^2+b^2+c^2+2ab-2bc-2ca$
66. $(a+b)^3 = a^3+b^3+3ab(a+b)$
67. $(a+b)^3 = a^3+b^3+3a^2b+3ab^2$
68. $(a-b)^3 = a^3-b^3-3ab(a-b)$
69. $(a-b)^3 = a^3-b^3-3a^2b+3ab^2$
70. $a^3+b^3 = (a+b)(a^2-ab+b^2)$
71. $a^3-b^3 = (a-b)(a^2+ab+b^2)$
72. $a^3+b^3+c^3-3abc = (a+b+c)(a^2+b^2+c^2-ab-bc-ca)$
73. If $(a+b+c)=0$ $then\ a^3+b^3+c^3 = 3abc$
74. $\frac{a^3+b^3}{a^2-ab+b^2} = a+b$
75. $\frac{a^3-b^3}{a^2+ab+b^2} = a-b$
76. $\frac{a^3+b^3}{a^2-ab+b^2} = a+b$
77. $x^m \times x^n = x^{m+n}$
78. $x^m \div x^n = x^{m-n}$
79. $(x^m)^n = x^{mn}$
80. $x^{-n} = \frac{1}{x^n}$
81. $x^n \times y^n = (xy)^n$
82. $Area\ of\ rectangle = lb$
83. $perimeter\ of\ rectangle = 2(l+b)$
84. Diagonal of rectangle $\sqrt{l^2+b^2}$
85. $Area\ of\ square = a^2$
86. $perimeter\ of\ square = 4a$
87. Diagonal of square $= \sqrt{2}a$
88. $Area\ of\ triangle = \frac{1}{2} \times base \times height$
89. $Area\ of\ Equilateral\ triangle = \frac{\sqrt{3}}{4} \times a^2$
90. $height\ of\ Equilateral\ triangle = \frac{\sqrt{3}}{2} \times a$
91. $Area\ of\ Isosceles\ triangle = \frac{b}{4}\sqrt{4a^2-b^2}$
92. Perimeter of $Isosceles\ triangle = (2a+b)$
93. $height\ of\ isosceles\ \Delta = \frac{1}{2}\sqrt{4a^2-b^2}$
94. Area of $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$
95. $S = \frac{a+b+c}{2}$
96. $area\ of\ circle = \pi r^2$
97. $circumference\ of\ circle = 2\pi r$
98. $area\ of\ semi\ circle = \frac{1}{2}\pi r^2$
99. $circumference\ of\ Semicircle = \pi r + 2r$
100. $volume\ of\ cube = a^3$
101. Lateral surface area of cube $= 4a^2$
102. Total surface area of cube $= 6a^2$
103. $diagonal\ of\ cube = \sqrt{3} \times a$
104. $volume\ of\ cuboid = lbh$
105. Lateral surface area of cuboid $= 2(l+b)h$

- Total surface area of cuboid $= 2(lb+bh+hl)$
- $diagonal\ of cuboid = \sqrt{l^2+b^2+h^2}$
- $volume\ of\ cylinder = \pi r^2 h$
- $curved\ surface\ of\ Cylinder = 2\pi rh$
- $T.S.A\ of\ cylinder = 2\pi rh + 2\pi r^2 = 2\pi r(h+r)$
- $volume\ of\ Cone = \frac{1}{3}\pi r^2 h$
- $curved\ surface\ of\ Cone = \pi rl$
- $T.S.A\ of\ Cone = \pi rl + \pi r^2$
- $l^2 = h^2 + r^2$
- $h^2 = l^2 - r^2$
- $r^2 = l^2 - h^2$
- $Volume\ of\ Sphere = \frac{4}{3}\pi r^3$
- S.A of $Sphere = 4\pi r^2$
- $Volume\ of\ HemiSphere = \frac{2}{3}\pi r^3$
- C.S.A of $hemisphere = 2\pi r^2$
- T.S.A of $hemisphere = 3\pi r^2$
- $mean = \frac{sum\ of\ obervations}{number\ of\ observations}$

  i. $Mean = \frac{\sum f_i x_i}{\sum f_i}$ **(Direct Method)**

  ii. $\bar{x} = A + \frac{\sum f_i d_i}{n}$ **(Assumed- Mean Method)**

  $x_i = \frac{Upper\ class\ limit + lower\ class\ limit}{2}$

  $A = Assumed\ mean$

  $d_i = (x_i - A)$

  iii. $\bar{x} = A + \left(\frac{\sum f_i u_i}{\sum f_i} \times h\right)$ $(\textbf{Step Deviation formula})$

  Where $u_i = \frac{(x_i - A)}{h}$

- Mode $M_0 = x_k + h\left(\frac{(f_k - f_{k-1})}{(2f_k - f_{k-1} - f_{k+1})}\right)$

  Where

  $x_k = lower\ limit\ of\ the\ model\ class\ interval;$

  $f_k = frequency\ of\ the\ modal\ class;$

  $f_{k-1} = frequency\ of\ the\ class\ preceding\ the\ modal\ class;$

  $f_{k+1} = frequency\ of\ the\ class\ Succeeding\ the\ modal\ class;$

  $h = width\ of\ the\ class\ interval.$

- $Median\ M_e = l + \left\{h \times \frac{\left(\frac{N}{2} - CF\right)}{f}\right\}$

  Where $l = lower\ limit\ of\ median\ class;$

  $h = width\ of\ median\ class;$

  $f = frequency\ of\ median\ class;$

  $cf = cumulative\ frequency\ of\ the\ class\ precding\ the\ median\ class$

  $N = \sum f_i.$

	0°	30°	45°	60°	90°
sin	0	$1/2$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$1/2$	0
tan	0	$1/\sqrt{3}$	1	$\sqrt{3}$	∞
cot	∞	$\sqrt{3}$	1	$1/\sqrt{3}$	0
sec	1	$2/\sqrt{3}$	$\sqrt{2}$	2	∞
cosec	∞	2	$\sqrt{2}$	$2/\sqrt{3}$	1