**MODERN PUBLIC SCHOOL SEC-37 FBD (HR)**

**SUB- MATHS (Holiday Homework 2023-24)**

**CLASS -XII**

**CHAPTER – 5**

1. **y = xlog x + (log x)x**
2. **y = xx  + x 1/x**
3. **if x16y9 = (x2 + y)17, prove that**

**x = 2y**

1. **if x13y7 = (x + y)20, prove that =**
2. **if xx  + yx = 1, prove that**

 **=**

1. **if y = sin (xx), prove that**

 **= cos (xx) . xx(1 + log x)**

1. **If xy + yx = (x + y)x +y, find**
2. **If xy .yx = 1, prove that**

1. **If yx = ey – x, prove that**

1. **If xm yn = 1, prove that**
2. **If (cos x)y = (tan y)x, prove that**

1. **If (sin x)y = (cos y)x, prove that**

1. **If ey = yx, prove that**
2. **If ex + ey = ex + y, prove that + ey – x = 0**
3. **If y = x sin (a + y), prove that**
4. **If ex + y – x = 0, prove that**
5. **If (sin x)y = x + y, prove that**
6. **If x sin (a + y) + sin a cos (a + y) = 0, prove that**
7. **If y = x sin y, prove that**
8. **If xy log (x + y) = 1, prove that**
9. **If y = log + tan−1, find**
10. **Find the derivative of the function f(x) given by**

***f*(x) = (1 + x) (1 + x2) (1 + x4) (1 + x8) and hence find *f*`(1)**

1. **If xy = ex – y, find**
2. **If y = (sin x – cos x)sin x – cos x, < x < , find**
3. **If yx + xy + xx = ab, find**

**ANSWER**

1. **xlog x + (log x)x**
2. **xx (1 + log x) + x1/x**

**7.**

**21.**

**22. 1 + 2x + 3x2 + …. + 15 x14 , *f* ΄ (1) = 120**

**23.**

**24. (sin x – cos x)sin x – cos x { (sin x + cos x) log (sin x – cos x) + (cos x + sin x)}**

**25.**

**CHAPTER – 6**

1. **If y = , prove that**
2. **If y = , prove that**
3. **If y = , prove that**
4. **If y = , prove that (2y – 1)**
5. **If y = , prove that = 2 at x =**
6. **If y = , prove that**
7. **If y = , prove that**
8. **If y = , prove that**

**CHAPTER - 7**

**Find , when**

1. **x = a (θ + sin θ) and y = a (1 – cosθ)**
2. **x = at2 and y = 2 at**
3. **x = aeθ (sin θ – cos θ), y = aeθ (sin θ + cos θ)**
4. **x = a cos θ and y = b sin θ**
5. **x = a (1 – cos θ) and y = a (θ + sin θ) at θ =**
6. **x = b sin2 θ and y = a cos2 θ**
7. **x = and y =**
8. **x = and y =**
9. **x = and y =**
10. **x = a (cos θ + θ sin θ) and y = a (sin θ – θ cos θ)**
11. **x = cos – 1 and y = sin -1  , t ∈ R**
12. **x = and y =**
13. **if x = 2 cos θ = cos 2 θ and y = sin 2 θ – sin 2 θ, prove that = tan**
14. **x = and y =**
15. **if x = cos t and y = sin t, prove that at t =**
16. **if x = ecos 2t and y = esin 2t, prove that**
17. **if x = sin-1 and y = tan-1 , -1 < t < 1, prove that = 1**
18. **if x = a and y = a , prove that**
19. **if x = and y = , find**
20. **if x = , y = , find**
21. **if x = 10 (t – sin t), y = 12 (1 – cos t)**
22. **if x = a and y = , find**

**ANSWERS**

1. **tan 2. 3. cot** 𝛉 **4. cot** 𝛉 **5. 1 6.**

**7. 8. 9. e-2** 𝛉**10. tan** 𝛉 **11.** 1

**12.**  **15. 19. 20. – cot 3t 21. cot**

**23.**

**CHAPTER – 8**

1. **Differentiate tan−1 with respect to**
2. **Differentiate sin −1  with respect to cos -1  , if 0 < x < 1**
3. **Differentiate tan−1 with respect to cos-1 , if 0 < x < 1.**
4. **Differentiate sin-1 (2x ) with respect to tan -1  , if < x <**
5. **Differentiate tan- 1  with respect to sec− 1 x.**
6. **Differentiate tan−1 with respect to sin-1 (3x – 4x3), if < x <**
7. **Differentiate cos -1 (4x3 – 3x) with respect to tan−1 , if < x < 1**
8. **Differentiate sin−1 with respect to tan−1 , if – 1 < x < 1**
9. **Differentiate sin−1 with respect to cot−1 , if 0 < x < 1**
10. **Differentiate tan−1 , with respect to sin−1 (2x ), if < x <**
11. **Differentiate tan−1 with respect to , if – 1 < x < 1**
12. **Differentiate sin−1 (2ax ) with respect to , if < ax <**

**ANSWER**

**1. 2. 1 3. 1 4. 2**

**5. 6. 7. 3 8. 1**

**9. 1 10. ½ 11. 12.**