Class XII

Chapter 6- Application of Derivatives

Topic – Tangents and Normals

Worksheet (Standard)

1. At point on the curve $y=x^2$ does the normal make an angle of 30 clockwise with the x-axis .(2)
2. Find the equation normal to the curve $x^{2/3}+ y^{2/3} =2$ at the point (1,1)(2)(HOTS)
3. Find the equation of tangent to the curve given by $x=a\sin^3 t$, $y=b\cos^3 t$ at a point where $t= \pi/2$(2)
4. Find the points on the curve $9y^2 = x^3$,where the normal to the curve makes equal intercepts with the axes. (2)
5. Find the points on the curve $x^2/4 +y^z/25=1$ at which the tangents are parallel to the X-axis. (2)
6. Find the point on the curve $y=3x^2 +4$ at which the tangent is perpendicular to the line with slope (-1/6) (2)
7. Find the points on the curve $x^2/16 +y^z/81=1$ at which the tangents are parallel to the Y-axis. (2)
8. If the curves y=2ex & y=ae-x intersect orthogonally,What is the value of a ? (2)
9. Show that the normal at any point θ to the curve x= acosθ+ a sinθ,y=asinθ-aθcosθ is at constant distance from the origin.(4)
10. Prove that the line x/a+y/b =1 is a tangent to the curve y=be-x/a at the point where the curve cuts Y-axis.(4)
11. The curve y=ax3+bx2+cx+5 touches the x-axis at the point (-2,0) and Cuts the y-axis at a point where the slope is 3.Find a,b,c (4)
12. Show that the curves x= y2 & xy=k cut at right angles if 8k2= 1 (4)
13. For the curve y = 4x3 -2x5 ,find all the points at which the tangent passes through the origin.(4)
14. prove that the curves y2 =4x & x2 +y-6x+1 =0 touch each other at the point (1,2)(4)
15. Find the co-ordinates of the point on the curve x 1/2 + y1/2 =4 at which tangent is equally inclined to the axes. (4)
16. Show that the curves xy= a2 and x2 + y2= 2a2 touch each other(4)
17. Find the equation of tangent to the curve y=cos(x+y),where $-2\pi<x<2\pi$ (HOTS) (4)

18. Find the condition for the curves x2/a 2 –y2 /b2 =1,xy=c 2 to intersect orthogonally. (4)

19.