

Class XII

Chapter 6- Application of Derivatives

Topic – Tangents and Normals

Worksheet (Basic)

1. The slope of the normal to the curve  $y = 3x^4 - 4x$  at  $x = 4$  is—(1)
2. If  $dy/dx$  does not exist at the point  $(x_0, y_0)$ , then the tangent at this point is parallel to ----- axis. (1)
3. Find the equation of the tangent to the curve  $y = x^4 - 6x^3 + 13x^2 - 10x + 5$  at  $(0, 5)$  (1)
4. The normal at the point  $(1,1)$  on the curve  $2y + x^2 = 3$  is  
(a)  $x+y=0$       (b)  $x-y=0$       (c)  $x+y+1=0$       (d)  $x-y=0$  (1)
5. The slope of the tangent to the curve  $x=t+3t-8, y=2t-2t-5$  at the point  $(2,-1)$  is  
(a)  $22/7$       (b)  $6/7$       (c)  $7/6$       (d)  $-6/7$  (1)
6. Find the points on the curve  $x^2/9 + y^2/16=1$  at which the tangents are parallel to Y-axis . (1)
7. Find the points on the curve  $y=x^3$  at which the slope of the tangent is equal to the y- coordinate of the point. (1)
8. Find the equation of the tangent to the curve  $y= x^2 - 2x + 7$  which is perpendicular to the line  $5y-15x=13$ (1)
9. Find the equation of the normal to the curve  $y= x^3 + 2x + 6$  which are parallel to the line  $x+14y+4 =0$ (1)
- 10.----- is the equation of the normal to the curve  $x^2 + 2y^2 - 4x - 6y + 8 = 0$  at the point whose abscissa is 2. (1)
11. The equation of the normal to the curve  $y = 2x^2 + 3 \sin x$  at  $x = 0$  is  
(a) 3      (b)  $1/3$       (c) -3      (d)  $-1/3$  (1)

12. The point on the curve  $y = x^3 - 11x + 5$  at which the tangent is

$y = x - 11$  is ----- (1)

13. The line  $y = x + 1$  is a tangent to the curve  $y^2 = 4x$  at the point

(a) (1, 2) (b) (2, 1) (c) (1, -2) (d) (-1, 2)(1)

14. The normal to the curve  $x = 4y$  passing (1,2) is

(a)  $x+y=3$  (b)  $x-y=3$  (c)  $x+y=1$  (d)  $x-y=1$  (1)

15. A point on the curve  $y = x^3 - 3x$ , where the tangent is parallel to the chord joining (1,-2) and (2,2) (1)

16. Find the equation of the tangent to the curve  $y = 3x - 2$  which is parallel to the line  $4x - 2y + 5 = 0$ . (2)

17. Find the slope of the tangent to the curve  $x = 1 - a \sin^3 \vartheta$ ,  $y = b \cos \vartheta$

at  $\vartheta = \pi/2$  (2)

18. Find points at which the tangent to the curve  $y = x^3 - 3x^2 - 9x + 7$  is

parallel to the x-axis (2)

19. Find the equation of the normal at the point  $(am^2, am^3)$  for the curve

$ay^2 = x^3$  (2)

20. Find the x co-ordinate of the point where the normal to  $f(x) = x^2 - 3x + 1$

at  $x = -1$  intersects the curve again. (2)