CLASS-XII, SUBJECT-MATHEMATICS

CHAPTER.APPLICATION OF INTEGRATION

WORKSEET (ADVANCED)

(6 MARKS QUESTIONS)

1. Using integration, find the area of the region bounded by the triangle whose vertices are (-2,1) , (0,4), (2,3).

2. Find area of the region enclosed by the circles $x^2 + y^2$ =16 and the line $\sqrt{3}y$ = x in the first quadrant.

3. Using integration, find the area of the region bounded by the circle $4x^2 + 4y^2$ = 9 and the parabola y^2 = 4x.

4. Using integration find area of the region bounded by the lines 3x - 2y + 1 = 0, 2x + 3y -21 = 0 and x – 5y + 9 = 0.

5. Find area of the region $\{(x, y) : x^2 + y^2 \leq 8 , x^2 \leq 2y \}$.

6. Find area of the region $\{(x, y) : x^2 \leq y \leq |x|\}$.

7. Find area of the region $\{(x, y) : y^2 \leq 6ax \ and \ x^2 + y^2 \leq 16a^2\}$.

8. Find area of the region $\{(x, y) : |x - 1| \leq y \leq \sqrt{5 - x^2}\}$.

9. Find area of the region
   $\{(x, y) : y^2 \geq ax \ and \ x^2 + y^2 \leq 2ax , x , y \geq 0 \}$.

10. Sketch the graph of y = $|x + 3|$ and evaluate the area under the curve y = $|x + 3|$ above x – axis and between x = - 6 to x = 0 .

11. Find area of the region bounded by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ and the line $\frac{x}{a} + \frac{y}{b}$ = 1.

12. Find area of the region bounded by y = $|x + 1| + 1$, x = - 3 , x = 3 and y = 0 .

13. Using integration, find area of the region bounded by the curves
    y = $\sqrt{4 - x^2}x^2 + y^2$ - 4x = 0 and the x –axis .

14. Using integration, find area of the region in the first quadrant enclosed by the y –axis, the line y = x and the circle $x^2 + y^2 = 32$.

15. Using integration, find area of the triangle formed by positive x – axis and tangent and normal to the circle $x^2 + y^2 = 4$ at(1 ,$\sqrt{3}$).

16. Using integration, find area of the region bounded by the line x – y + 2 = 0, the curve x = $\sqrt{y}$ and y – axis.

17. Using integration, proves that the curves y^2 = 4x and x^2 = 4y divide the area of the square bounded by x = 0, x = 4 , y = 4 and y = 0 into three equal parts .

18. Using integration, find the area of the greatest rectangle that can be inscribed in an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$.