



# MATHS

## BOOKS - NAVBODH MATHS (HINGLISH)

### APPLICATIONS OF DEFINITE INTEGRALS ( AREA )

#### Solved Examples

1. Find the area of the region bounded by parabola  $y^2 = 16x$  and the line  $x = 3$ .



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2. Find the area of the region bounded by the curve  $y = \sin x$ , the lines  $x = -\frac{\pi}{2}$ ,  $x = \frac{\pi}{2}$  and X- axis.



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3. Find the area of the region bounded by the curve  $x^2 = 16y$ , lines  $y = 2$ ,  $y = 6$  and Y - axis lying in the first quadrant.



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4. Find the area of the region bounded by the

ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$



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5. Find the area, lying above the x-axis and included between the circle  $x^2 + y^2 = 8x$  and the parabola  $y^2 = 4x$ .



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6. Find the area bounded by the circle  $x^2 + y^2 = 16$  and the line  $y=x$  in the first quadrant .



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7. Find the area of the region included between the parabolas  $y^2 = 4ax$  and  $x^2 = 4ay$ , where  $a > 0$ .



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8. The area bounded by the curves

$y^2 = 4a^2(x - 1)$  and lines  $x = 1$  and  $y = 4a$  is



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9. Find the area enclosed between the circle

$x^2 + y^2 = 1$  and the line  $x + y = 1$  lying in

the first quadrant.



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10. The area bounded by the loop of the curve

$$y^2 = x^2(1 - x) \text{ is}$$



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## Examples For Practice 2 Marks

1. Find the area of the region bounded by the

curve  $y = \sqrt{16 - x^2}$ , the X - axis and the

lines  $x = 0$ ,  $x = 4$ .



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2. Find the area of the region bounded by the parabola  $y^2 = 16x$  and the line  $x = 4$ .



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3. Find the area of the region bounded by the parabola  $y^2 = 4x$ , X- axis and the lines  $x = 1, x = 4$ .



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4. Find the area of the region bounded by the curve  $y = \sqrt{6x + 4}$ , the X - axis and the lines  $x = 0, x = 2$ .



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5. Find the area bounded by the curve  $y^2 = 4ax$ , X - axis and the lines  $x = 0$  and  $x = a$ .



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6. Find the area of the region bounded by the curve  $y = \sin x$  between  $x = 0$  and  $x = 2\pi$ .



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7. Examples: Find the area bounded by the parabola  $y^2 = 4ax$  and its latus rectum.



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8. Find the area of the region bounded by the curve  $y = x^2$  and the line  $y = 4$ .



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## Examples For Practice 3 Or 4 Marks

1. Find the area of the

(1) circle  $x^2 + y^2 = 25$ .

(2) ellipse  $\frac{x^2}{1} + \frac{y^2}{4} = 1$ .



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2. Find the area of the region included between the parabola  $y^2 = x$  and the line  $x + y = 2$ .



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3. Using integration, find the area of the region common to the circle  $x^2 + y^2 = 16$  and the parabola  $y^2 = 6x$ .



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4. Find the area of the region lying between the parabolas  $4y^2 = 9x$  and  $3x^2 = 16y$ .



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5. Find the area of the loop of the curve  $y^2 = x(1 - x)^2$ .



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