



# MATHS

## BOOKS - SHARAM PUBLICATION

### APPLICATION OF INTEGRALS

#### Example

1. Find the area of the trapezium bounded by the sides  $y = x$ ,  $x = 0$ ,  $y = 3$ ,  $y = 4$ .



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2. Find the area bounded by the curve  $x = y^2$  and the straight lines  $x = 0, y = 1$ .



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3. Find the area bounded by

$$y = \sin x, y = 0, x = \frac{\pi}{2}$$



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4. Find the area of the circle

$$x^2 + y^2 = 2ax.$$



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5. Find the area bounded by

$$y = \sin x, y = 0, x = \frac{\pi}{2}$$



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6. Find the area bounded by the curve  $y = 3x^2 + 5$ ,  $y = 0$  and two ordinates  $x = 1$  and  $x = 2$ .



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7. Find the area bounded by

$y = e^x$ ,  $y = 0$ ,  $x = 4$ ,  $x = 2$



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8. Find the area of region enclosed by

$$y^2 = 4ax \text{ and } x^2 = 4ay.$$



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9. The area between  $x = y^2$  and  $x = 4$  is divided into two equal parts by the line  $x = a$ .

Find the value of a.



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**10.** Find the area enclosed by the parabola

$y^2 = 4x$  and the line  $y = 2x$ .



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**11.** Determine the area of the region bounded

by the curve  $y^4 = x^3$  and the double ordinate

through (2,0).



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**12.** Show that the area bounded by the parabolas  $y^2 = 4x$  and  $x^2 = 4y$  is equal to the area bounded by the curve  $x^2 = 4y$  and the lines  $y = 0$  and  $x = 4$ .



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**13.** Determine the area common to the parabola  $y^2 = x$  and the circle  $x^2 + y^2 = 2x$ .



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**14.** Find the area enclosed by  $y = 4x - 1$  and  $y^2 = 2x$ .



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**15.** Find the area of the region between the curves  $y = \cos x$  and  $y = \sin x$ ,  $x \in \left[0, \frac{\pi}{4}\right]$ .



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16. Find the area of the ellipse  $\frac{x^2}{9} + \frac{y^2}{16} = 1$ .



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17. Find the area of the smaller region bounded by the ellipse  $\frac{x^2}{9} + \frac{y^2}{4} = 1$  and the line  $\frac{x}{3} + \frac{y}{2} = 1$ .



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