

Exercise 8.9

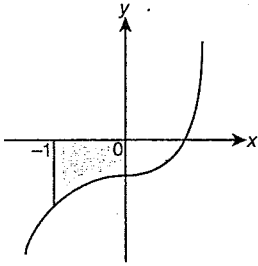
- Find the area bounded by the curve $y = f(x)$, the x -axis and the stated ordinates in the following cases.
 - $y = x^3 + 2x^2 + x + 1$, $x = -1$ and $x = 2$
 - $y = x^2 - 25$, $x = -5$ and $x = 5$
 - $y = -3x^2 - 12x + 10$, $x = 1$ and $x = 4$
- Sketch the curve and find the area between the curve and the x -axis between the given boundaries.
 - $y = x^5 - 2$ between $x = -1$ and $x = 0$
 - $y = x^4 - x^2$ between $x = -1$ and $x = 1$
 - $y = x^3 + x^2 - 2x$ between $x = -3$ and $x = 2$
 - $y = x^2 - x - 2$ between $x = -2$ and $x = 3$.
- In each of the following, determine the area enclosed by the given boundaries.
 - $y = 10 - x^2$ and $y = x^2 + 2$
 - $y = 4e^{2x}$, $y = 4e^{-x}$, $x = 1$ and $x = 3$
 - $y = x^2 - 4x + 20$, $y = 3x$, $x = 0$ and $x = 4$
- Find the area enclosed by the curve $y = x^3$ and the straight line $y = x$.
- Sketch the curves with equations $y = x^2$ and $y = 4x - x^2$.
Find the coordinates of the points of intersection of the curves.
Find the area of the region enclosed by the curves.
- Sketch the curve $y = x(4 - x)$ and the line $y = 2x - 3$.
Find the coordinates of the points of intersection of the line and the curve.
Find the area of the region enclosed by the line and the curve.
- Sketch on the same diagram, the curves given by the equations
 $xy = 6$ and $y = 9 - 3x$, $x > 0$
Show, by integration, that the area bounded by the two curves is $\frac{9}{2} - 6 \ln 2$.
- Find the coordinates of c , the point of intersection of the curves
 $y = e^x$ and $y = 2 + 3e^{-x}$.
If both curves cut the y -axis at the points A and B , calculate the area bounded by AB and the arcs AC and BC .
- The curves $y = 3 \sin x$ and $y = 4 \cos x$ ($0 \leq x \leq \frac{\pi}{2}$) intersect at point A and meet the x -axis at the origin O and point $B(\frac{\pi}{2}, 0)$ respectively. Prove that the area enclosed by the arcs OA , AB and the line OB is 2 square units.

ANSWERS

Latihan 8.9

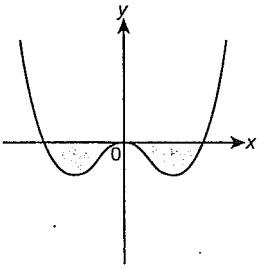
1. (a) $14\frac{1}{4}$ units² (b) $\frac{500}{3}$ units² (c) 123 units²

2. (a)



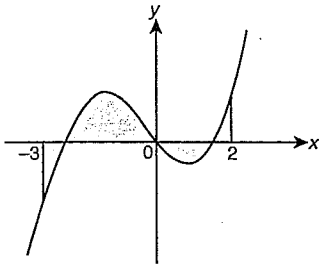
$$\text{area} = 2\frac{1}{6} \text{ units}^2$$

(b)



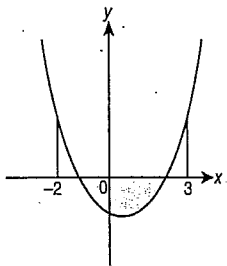
$$\text{area} = \frac{4}{15} \text{ units}^2$$

(c)



$$\text{area} = 11\frac{1}{12} \text{ units}^2$$

(d)

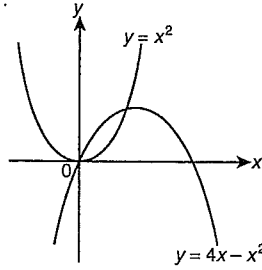


$$\text{area} = 8\frac{1}{6} \text{ units}^2$$

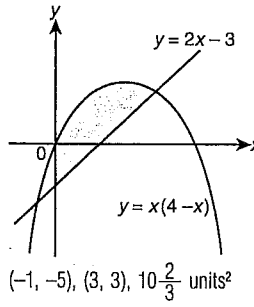
3. (a) $21\frac{1}{3}$ units² (b) 791 units² (c) $45\frac{1}{3}$ units²

4. $\frac{1}{2}$ units²

5. (0, 0), (2, 4); $2\frac{2}{3}$ units²

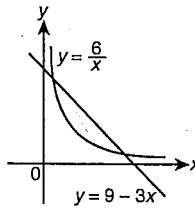


6. (a)



(-1, -5), (3, 3), $10\frac{2}{3}$ units²

7.



8. (ln 3, 3), 2 ln 3 units²