Class 12 Mathematics · Chapter 8: Application of Integrals

Worksheet · 20 marks · about 40 minutes · based on NCERT

Name _____ Class and section _____ Date _____

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1. Given that $\int_0^2 (x - 2)\,dx = -2$, the area of the region bounded by $y = x - 2$, the x-axis and the ordinates $x = 0$ and $x = 2$ is [1]

(a) −2
(b) 0
(c) 4
(d) 2

2. If $f(x) < 0$ for every x in [a, b], then the area of the region bounded by $y = f(x)$, the x-axis and the ordinates $x = a$ and $x = b$ is [1]

(a) $\int_a^b f(x)\,dx$
(b) $-\int_a^b f(x)\,dx$
(c) $\int_a^b f(-x)\,dx$
(d) $-\int_b^a f(x)\,dx$

3. The area of the region bounded by $y = e^x$, the x-axis and the ordinates $x = 0$ and $x = \log 3$ is [1]

(a) 3
(b) log 3
(c) 2
(d) $e^3 - 1$

4. The area of one arch of $y = \sin 2x$, between consecutive zeros, is what fraction of the area of one arch of $y = \sin x$? [1]

(a) 2
(b) 1
(c) $\frac{1}{2}$
(d) $\frac{1}{4}$

5. The ellipse $\frac{x^2}{a^2} + \frac{y^2}{4} = 1$ encloses an area of 12π square units. Then a equals [1]

(a) 3
(b) 12
(c) 36
(d) 6

6. Find the area of the region bounded by the curve $y = 4x - x^2$ and the x-axis. [2]

7. Among all ellipses $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ with $a + b = 6$, find the one that encloses the greatest area, and that area. [2]

8. Find the area of the region enclosed between the curve $y = x^2 - 2x$ and the x-axis. [2]

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9. Find the area of the region bounded by the curve $y = \sin x + \cos x$, the x-axis and the ordinates $x = 0$ and $x = \pi$. [3]

10. Find the area of the region bounded by the curve $y = x(x - 1)(x - 2)$, the x-axis and the ordinates $x = 0$ and $x = 2$. [3]

11. Find the area of the region bounded by the curve $y = e^x$, the y-axis and the line $y = e$, (a) using horizontal strips, and (b) as a rectangle less the area under the curve. [3]