# MATHS

## BOOKS - MCGROW HILL EDUCATION MATHS (HINGLISH)

## AREA BY INTEGRATION

### Illustration

**1.** Find the area between the curve $y = x(x - 3)$ and the ordinates x = 3 and x = 5.

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**2.** Determine the are between $y = 2x^2 + 10$ and $y = 4x + 16$

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**3.** Find the area between the curve $y = x(x - 3)$ and the ordinates x = 0 and x = 5.

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**4.** Find the area of the region in the first quadrant enclosed by $x = y^2$ and $x = y + 2$

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## Solved Examples Concept Based Single Correct Answer Type Questions

**1.** The area of region between $y = 4 - x^2, 0 \leq x \leq 2$ and the x-axis is

A. $\frac{4}{3}$

B. $\frac{7}{3}$

C. $\frac{16}{3}$

D. $\frac{5}{3}$

**Answer: C**

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**2.** The area of the region enclosed by $y = x^2$ and $y = \sqrt{|x|}$ is

A. 1

B. $\frac{1}{2}$

C. $\frac{1}{3}$

D. 2

**Answer: C**

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**3.** The area of the region bounded by the curve $y = x^2$ and y = x is equal to

A. $\frac{1}{6}$

B. $\frac{1}{2}$

C. $\frac{1}{3}$

D. 1

**Answer: A**

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**4.** The area of the regioin bounded by $y = \log x, y = 2$ and the coordinate axes is

A. $e^2 - 2$

B. $e^2 - 1$

C. $e^2 - e$

D. $e^2 + 1$

**Answer: B**

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**5.** Find the area bounded by $x = 2y - y^2 and they - a\xi s.$

A. $\frac{1}{3}$

B. $\frac{2}{3}$

C. 1

D. $\frac{4}{3}$

**Answer: D**

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## Solved Examples Level 1 Single Correct Answer Type Questions

**1.** The area of the region bounded by the lines $x = 0, x = \frac{\pi}{2}$ and $f(x) = \sin x, g(x) = \cos x$ is (A) $2\left(\sqrt{2}+1\right)$ (B) $\sqrt{3}-1$ (C) $2\left(\sqrt{3}-1\right)$ (D) $2\left(\sqrt{2}-1\right)$

A. $2\left(\sqrt{2}-1\right)$

B. $\sqrt{3}-1$

C. $2\left(\sqrt{3}-1\right)$

D. $2\left(\sqrt{2}+1\right)$

**Answer: A**

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**2.** Area bounded by the curve y = $\sqrt{5-x^2}$ and y = |x-1| is

A. $\left(\frac{5}{4}\pi - 2\right)$

B. $\left(\frac{5\pi - 2}{4}\right)$

C. $(5\pi - 2)/2$

D. $(\pi/2 - 5)$

**Answer: B**

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**3.** The area bounded by the curves $y^2 = 4x$ and $x^2 = 4y$

A. $32/3$

B. $16/3$

C. $8/3$

D. 0

**Answer: B**

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**4.** The area of the plane region bounded by the curves $x + 2y^2 = 0$ and $x + 3y^2 = 1$ is equal to (1) $\frac{5}{3}$ (2) $\frac{1}{3}$ (3) $\frac{2}{3}$ (4) $\frac{4}{3}$

A. $5/3$

B. $1/3$

C. $2/3$

D. $4/3$

**Answer: D**

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**5.** The area of the region enclosed by the curves $y = x, x = e, y = \frac{1}{x}$ and the positive x-axis is (A) $\frac{3}{2}$ sq. units (B) $\frac{5}{2}$ sq. units (C) $\frac{1}{2}$ sq. units (D) 1 sq. units

A. $5/2$ square unit

B. $\frac{1}{2}$ square units

C. 1 square unit

D. $\frac{3}{2}$ square units

**Answer: D**

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**6.** The area bounded between the parabola $x^2 = \frac{y}{4}$ and $x^2 = 9y$ and the straight line $y = 2$ is

A. $\frac{10\sqrt{2}}{3}$

B. $\frac{20\sqrt{2}}{3}$

C. $10\sqrt{2}$

D. $20\sqrt{2}$

**Answer: B**

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**7.** Let $F(x)$ bet the area bounded by the curve $f(t) = \frac{e^t}{t}$ between $t = a(a > 1), t = x$ and axis of abscissa then the area bounded by $g(t) = \frac{e^t}{1 + t_0}(t_0 > 0)$ between t = a, t = x and axis of abscissa is

A. $e^{t_0}[F(x + t_0) - 2F(a + t_0)]$

B. $e^{t_0}[F(x + t_0) - F(a + t_0)]$

C. $e^{-t_0}[F(x + t_0) - F(a + t_0)]$

D. $e^{-t_0}[F(x + t_0) - F(a + t_0)]$

**Answer: C**

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

A. $\frac{32}{3} + 2\pi$

B. $\frac{32}{3} + 6\pi$

C. $\frac{16}{3} + 4\pi$

D. $\frac{32}{3} + 4\pi$

**Answer: D**

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**9.** Find the ratio in which the area bounded by the curves $y^2 = 12x and x^2 = 12y$ is divided by the line $x = 3$.

A. $15 : 49$

B. $13 : 48$

C. $12 : 37$

D. $16 : 35$

**Answer: A**

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**10.** The area bounded by the curve $y = |x - 1|$ and $y = 3 - |x|$

A. 6

B. 2

C. 4

D. 3

**Answer: C**

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**11.** Let f(x) = minimum $\left(x + 1, \sqrt{1 - x}\right)$ for all $x \leq 1$. Then the area bounded by y=f(x) and the x-axis is

A. $\frac{7}{3}$

B. $\frac{7}{6}$

C. $\frac{11}{6}$

D. $\frac{1}{6}$

**Answer: B**

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**12.** The area of the region bounded by $x = 1, x = 2, y = 4x + 1, y = e^x$ is

A. $7 + e - e^2$

B. $5 + e - e^2$

C. $7 - e + e^2$

D. $7 - 2e + e^2$

**Answer: A**

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## Solved Examples Level 2 Single Correct Answer Type Questions

**1.** The area between the curve $y = -x^2 + 4x$ and $y = x^2 - 6x + 5$ over the interval $0 \leq x \leq 1$ is

A. $\frac{52}{3} + 5\sqrt{15}$

B. $-\frac{52}{3} + 5\sqrt{15}$

C. $-\frac{52}{3} + 3\sqrt{15}$

D. $\frac{47}{3} + 5\sqrt{15}$

**Answer: B**

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**2.** Find the area of the region bounded by the curve $y^2 = 9x$ and $y = 3x$.

A. 1

B. $1/4$

C. $1/2$

D. 2

**Answer: C**

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**3.** The area of the plane figure bounded by lines $y = \sqrt{x}, x \in [0, 1], y = x^2, x \in [1, 2]$ and $y = -x^2 + 2x + 4, x \in [0, 2]$ is

A. $10/7$

B. $10/3$

C. $3/5$

D. $4/3$

**Answer: B**

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**4.** The value of $a(a > 0)$ for which the area bounded by the curves $y = \frac{x}{6} + \frac{1}{x^2}, y = 0, x = a,$ and $x = 2a$ has the least value is ___.

A. 1

B. $\sqrt{2}$

C. 2

D. $2^{1/3}$

**Answer: D**

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**5.** The area bounded by the curve $y = x\left(x^2 - 1\right)$ and x-axis is

A. 0

B. $\frac{1}{2}$

C. 1

D. $\frac{1}{4}$

**Answer: B**

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**6.** The area between the curves $x = 1 - y^2$ and $x = y^2 - 1$ is

A. $\frac{4}{3}$

B. $\frac{1}{3}$

C. $\frac{8}{3}$

D. $\frac{5}{3}$

**Answer: C**

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**7.** The area bounded by $y = x^2, y = \sqrt{x}, 0 \leq x \leq 4$ is

A. $\frac{20}{3}$

B. $\frac{10}{3}$

C. 10

D. $\frac{50}{3}$

**Answer: D**

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**8.** The area of the region enclosed by $y = x^3 - 2x^2 + 2$ and $y = 3x + 2$ is

A. $\frac{71}{6}$

B. 14

C. $\frac{29}{3}$

D. $\frac{71}{3}$

**Answer: A**

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## Solved Examples Numerical Answer Type Questions

**1.** Find the area bounded by the curves $x = y^2$ and $x = 3 - 2y^2$.

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**2.** If A is the area of the figure bounded by the straight lines x = 0 and x = 2 and the curves y = 2x and $y = 2x - x^2$ then the value of $\left(\frac{3}{\log 2} - A\right)$ is

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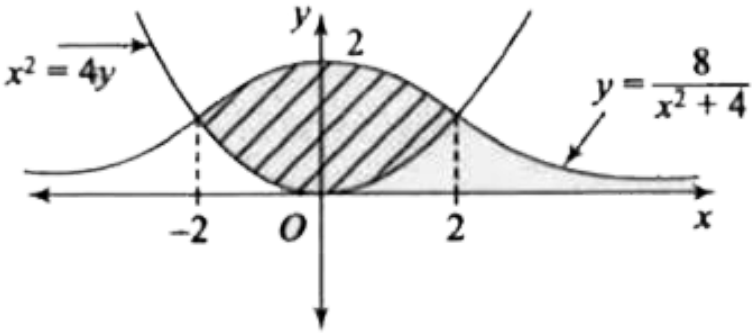
**3.** If S is the area of the figure given below, then S is equal to $(\pi = 3.14)$

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**4.** If A is the area of the loop given below than A is equal to

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**5.** If S is the area in the figure below then S is equal to

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Exercise Concept Based Single Correct Answer Type Questions

**1.** The area below $y = e^x$ and above y = x between x = 0 and x = 2 is

A. $e^2 - 1$

B. $e^2 + e$

C. $e^2 - 3$

D. $e + 2$

**Answer: C**

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**2.** The area between y = x and $y = x^2, 0 \leq x \leq 2$ is

A. 1

B. $\frac{2}{3}$

C. $\frac{1}{3}$

D. $\frac{4}{3}$

**Answer: A**

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**3.** The area of the region bounded by $y = x^2 - x$ and $y = 2x + 4$ is

A. $\frac{175}{6}$

B. $\frac{31}{6}$

C. 12

D. $\frac{125}{6}$

**Answer: D**

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**4.** The area of the region enclosed by the parabola $y = 2 - x^2$ and the straight line $y = -x$ is equal to:

A. $\frac{8\sqrt{2}+3}{7}$

B. $\frac{8\sqrt{2}+6}{7}$

C. $\frac{7\sqrt{2}-1}{5}$

D. $\frac{7\sqrt{2}+1}{3}$

**Answer: B**

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**5.** The area of the region bounded by $y = x^2$ and $y = -x^2 + 2$ is

A. $\frac{5}{3}$

B. $\frac{4}{3}$

C. $\frac{8}{3}$

D. 1

**Answer: C**

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## Exercise Level 1 Single Correct Answer Type Questions

**1.** The total area between $y = 4x - x^2$ and $y = x$ from x = 0 and x = 4 is

A. $17/3$

B. $37/6$

C. $\frac{19}{3}$

D. 4

**Answer: c**

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**2.** The area between the curves $y = x^2$ and $y = x^{1/3}$, $-1 \leq x \leq 1$ is

A. $\frac{1}{2}$

B. 2

C. $\frac{3}{4}$

D. $\frac{3}{2}$

**Answer: D**

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**3.** The area of the region bounded by the parabola $(y-2)^2 = x-1$, the tangent to the parabola at the point $(2, 3)$ and the x-axis is

A. 9

B. 12

C. 3

D. 6

**Answer: A**

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**4.** The area bounded by the curves $y = \cos x$ and $y = \sin x$ between the ordinates $x = 0$ and $x = \frac{3\pi}{2}$ is

A. $4\sqrt{2} - 1$

B. $4\sqrt{2} + 1$

C. $4\sqrt{2} - 2$

D. $4\sqrt{2} + 2$

**Answer: C**

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**5.** The area included between $x^2 + y^2 = 4x$ and $y^2 = x$ above x-axis is

A. $\frac{4}{3}(3\pi - 8)$

B. $\frac{2}{3}(8+3\pi)$

C. $\frac{1}{3}(4+3\pi)$

D. $\frac{5\sqrt{3}}{2}+\frac{2\pi}{3}$

**Answer: D**

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**6.** The area of the region bounded by $y=2\cos x$, $y=3\tan x$ and the y-axis is

A. $1+\frac{3}{2}\log 3-\log 2$

B. $\log\frac{3}{2}$

C. $1+3\log\frac{2}{\sqrt{3}}$

D. $1+\frac{3}{2}\log 3-\log 8$

**Answer: D**

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**7.** The area bounded by $y = \sin^{-1} x$, y-axis and $|y| = \frac{\pi}{2}$ is

A. 2

B. $\pi$

C. $2\pi$

D. 1

**Answer: A**

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**8.** The area of the region bounded by $x = 1, x = 2, y = \log x$ and $y = 3^x$ is

A. $\frac{9}{\log 3} + \log \frac{e}{4}$

B. $\frac{6}{\log 3} - 2\log 2 + 1$

C. $\frac{3}{\log 3} - 2\log 2$

D. $\frac{9}{\log 3} - 2\log 2 + 1$

**Answer: B**

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**9.** The area inside the parabola $5x^2 - y = 0$ but outside the parabola $2x^3 - y + 9 = 0$ is

A. $4\sqrt{3}$

B. $6\sqrt{3}$

C. $12\sqrt{3}$

D. $8\sqrt{3}$

**Answer: C**

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**10.** The area bounded by the curve $y = 2$ log x, x-axis, y-axis and y = log 5 is equal to

A. $3\left(\sqrt{5}-1\right)$

B. 4

C. $2\left(\sqrt{5}-1\right)$

D. $\sqrt{5}-1$

**Answer: C**

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**11.** Let $A = \left\{(x, y) : y^2 \leq 4x, y - 2x \geq -2, y \geq 0\right\}$. The area of the region A is

A. $\frac{2}{3}\left(1+\sqrt{5}\right)^{3/2} - 2$

B. $\frac{4}{3}\left(3+\sqrt{5}\right)^{3/2}$

C. $\frac{2}{3\lceil 3}(3+\lceil 5)^{3/2}-\frac{1}{2}(7+3\lceil 5)$

D. $\frac{4}{3}\left(3+\sqrt{5}\right)^{3/2}-\left(5+4\sqrt{5}\right)$

**Answer: C**

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**12.** The area of the region above x-axis bounded by $y=\cot x, \frac{\pi}{12}\leq x\leq\frac{\pi}{4}$ is

A. 1

B. $\log\left(\sqrt{2}+1\right)$

C. $\log\left(\sqrt{5}+1\right)$

D. $\log\left(\sqrt{3}+1\right)$

**Answer: D**

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## Exercise Level 2 Single Correct Answer Type Questions

**1.** The area between $x = y + 3$ and $x = y^2$ from y = -1 to $y = 1$ is

A. $\frac{4}{3}$

B. $\frac{16}{3}$

C. $\frac{5}{3}$

D. 4

**Answer: B**

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**2.** The area of the region between $y = 3x^3 - x^2 - 10x$ and $y = -x^2 + 2x$ is

A. 10

B. 12

C. 18

D. 24

**Answer: D**

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**3.** The area of the region bounded by y = x - 1 and $x = 3 - y^2$ is

A. $\frac{5}{2}$

B. $\frac{7}{2}$

C. $\frac{9}{2}$

D. 4

**Answer: C**

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**4.** The area between the curves $y = x^2 + 3$ and $y = -x^2 - 1$ on [-2, 2] is

A. $\frac{80}{3}$

B. $\frac{29}{3}$

C. 21

D. $\frac{47}{3}$

**Answer: A**

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**5.** The area the region enclosed by $f(x) = x^3 - 10x$ and $g(x) = 6x, x \geq 0, y \geq 0$ is

A. 24

B. 39

C. 42

D. 84

**Answer: B**

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**6.** The area bounded by $y = x^2$ and $y = 1 - x^2$ is

A. $\sqrt{8}/3$

B. $16/3$

C. $32/3$

D. $16/3$

**Answer: A**

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**7.** The area of the region bounded by the lines $x = 0, x = \frac{\pi}{2}$ and $f(x) = \sin x, g(x) = \cos x$ is (A) $2\left(\sqrt{2}+1\right)$ (B) $\sqrt{3}-1$ (C) $2\left(\sqrt{3}-1\right)$ (D) $2\left(\sqrt{2}-1\right)$

A. $2\left(\sqrt{2}-1\right)$

B. $\sqrt{3}-1$

C. $2\left(\sqrt{3}-1\right)$

D. $2\left(\sqrt{2}+1\right)$

**Answer: A**

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**8.** The area of the figure bounded by the curves $y^2 = 2x + 1$ and $x - y - 1 = 0$, is

A. $16/3$

B. $4/3$

C. $8/3$

D. $\frac{11}{3}$

**Answer: A**

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## Exercise Numerical Answer Type Questions

**1.** If A is the area bonded by $x = |y^2 - 1|$ and $y = x - 5$ then A is equal to

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**2.** If the x-axis divides the area of the rigion bounded by the parabolas $y = 4 - x - ^2$ and $y^2 - x^2 - x$ in the ratio of a: b, then ab is equal to

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**3.** The line $y = mx$ bisects the area enclosed by the curve $y = 1 + 4x - x^2$ and the lines $x = 0, x = \frac{3}{2} and y = 0.$ Then the value of $m$ is $\frac{13}{6}$ b. $\frac{6}{13}$ c. $\frac{3}{2}$ d. $4$

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**4.** Let A be the area bounded by the curve $y = \sin x (0 \leq x \leq \pi)$ and x-axis and B is the area bounded by the curves $y = \sin x (0 \leq x \leq \pi/2), y = a \cos x (0 \leq x \leq \pi/2)$ and x-axis $(a > 0)$. If A:B=1, then a is equal to

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**5.** If the area bounded by the curve $f(x) = x^{1/3}(x - 1)$ and the x-axis is A, then the value of 28A is__.

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## Question From Previous Years Aieee Jee Main Papers

**1.** The area of the region bounded by the curves $y = |x - 2|$, x=1, x=3 and $the x - a\xi sis(A)3(B)2(C)1(D)4`$

A. 3

B. 2

C. 1

D. 3

**Answer: C**

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**2.** The area enclosed between the curve $y = \log_e(x + e)$ and the coordinate axes is

A. 3

B. 4

C. 1

D. 2

**Answer: C**

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**3.** The area enclosed between the curves $y^2 = xandy = |x|$ is (1) 2/3 (2) 1 (3) 1/6 (4) 1/3

A. $\frac{2}{3}$

B. 1

C. $\frac{1}{6}$

D. $\frac{1}{3}$

**Answer: C**

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**4.** The area of the plane region bounded by the curves $x + 2y^2 = 0$ and $x + 3y^2 = 1$ is equal to (1) $\frac{5}{3}$ (2) $\frac{1}{3}$ (3) $\frac{2}{3}$ (4) $\frac{4}{3}$

A. $5/3$

B. $1/3$

C. $2/3$

D. $4/3$

**Answer: D**

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**5.** The area of the region bounded by the parabola $(y-2)^2 = x - 1$, the tangent to the parabola at the point $(2, 3)$ and the x-axis is

A. 9

B. 12

C. 3

D. 6

**Answer: A**

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**6.** The area bounded by the curves y = cos x and y = sin x between the ordinates x = 0 and $x = \frac{3\pi}{2}$, is

A. $4\sqrt{2} - 1$

B. $4\sqrt{2} + 1$

C. $4\sqrt{2} - 2$

D. $4\sqrt{2} + 2$

**Answer: C**

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**7.** The area bounded by the curves $y^2 = 4x$ and $x^2 = 4y$

A. $\frac{32}{3}$

B. $\frac{16}{3}$

C. $\frac{8}{3}$

D. 0

**Answer: B**

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**8.** The area bounded between the parabolas $x^2 = \frac{y}{4}$ and $x^2 = 9y$ and the straight line y=2 is

A. $\frac{10\sqrt{2}}{3}$

B. $\frac{20\sqrt{2}}{3}$

C. $10\sqrt{2}$

D. $20\sqrt{2}$

**Answer: B**

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**9.** The area bounded by the curves $y = \sqrt{x}, 2y - x + 3 = 0,$ X-axis and lying in the first quadrant is

A. 36

B. 18

C. $\frac{27}{4}$

D. 9

**Answer: D**

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**10.** The area under the curve $y = |\cos x - \sin x|, 0 \leq x \leq \frac{\pi}{2}$, and above x-axis is: (A) $2\sqrt{2} + 2$ (B) $0$ (C) $2\sqrt{2} - 2$ (D) $2\sqrt{2}$

A. $2\sqrt{2}$

B. $2\sqrt{2} - 2$

C. $2\sqrt{2} + 2$

D. 0

**Answer: B**

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**11.** The area bounded by the curve $y = \ln(x)$ and the lines $y = 0, y = \ln(3)$ and $x = 0$ is equal to

A. 3

B. $3 \log - 2$

C. $3\log 3 + 2$

D. 2

**Answer: D**

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**12.** The area of the region described by $A = \{(x, y) : x^2 + y^2 \leq 1$ and $y^2 \leq 1 - x\}$ is :

A. $\frac{\pi}{2} + \frac{4}{3}$

B. $\frac{\pi}{2} - \frac{4}{3}$

C. $\frac{\pi}{2} - \frac{2}{3}$

D. $\frac{\pi}{2} + \frac{2}{3}$

**Answer: A**

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**13.** Let $A = \{(x, y); y^2 \leq 4x, y - 2x \leq -4\}$ The area (insurunits) of the region A is

A. 8

B. 9

C. 10

D. 11

**Answer: B**

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**14.** The area of the region bounded by the curve $y = \tan x$, tangent drawn to the curve at $x = \frac{\pi}{4}$ and the x-axis is

A. $\frac{1}{2}\left(\log 2 - \frac{1}{2}\right)$

B. $\frac{1}{2}\left(\log 2 + \frac{1}{2}\right)$

C. $\frac{1}{2}(1-\log 2)$

D. $\frac{1}{2}(1+\log 2)$

**Answer: A**

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**15.** The area (in square units) of the region bounded by the curves $y+2x^2=0, y+3x^2=1$ is equal to

A. $\frac{3}{5}$

B. $\frac{3}{4}$

C. $\frac{1}{3}$

D. $\frac{4}{3}$

**Answer: D**

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**16.** The area (in square units) of the region described by $\{(x, y) : y^2 \leq 2x \text{ and } y \leq 4 - x\}$ is

A. $\frac{7}{32}$

B. $\frac{5}{64}$

C. $\frac{15}{64}$

D. $18$

**Answer: D**

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**17.** The area (in square units) of the region $\{(x, y) : y^2 \geq 2x \text{ and } x^2 + y^2 \leq 4x, x \geq 0, y \geq 0\}$ is

A. $\pi - \frac{4}{3}$

B. $\pi - \frac{8}{3}$

C. $\pi - \frac{4\sqrt{2}}{3}$

D. $\frac{\pi}{2} - \frac{2\sqrt{2}}{3}$

**Answer: B**

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**18.** The area (in sq. units) of the region described by $A = \{(x, y) : y \geq x^2 - 5x + 4, x + y > 1, y \leq 0\}$ is

A. $\frac{19}{6}$

B. $\frac{17}{6}$

C. $\frac{7}{2}$

D. $\frac{13}{6}$

**Answer: A**

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**19.** The area ( in sq. units) of the region $\{(x, y) : x \geq 0, x + y \leq 3, x^2 \leq 4y \text{ and } y \leq 1 + \sqrt{x}\}$ is :

A. $\frac{5}{2}$

B. $\frac{59}{12}$

C. $\frac{3}{2}$

D. $\frac{7}{3}$

**Answer: A**

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**20.** The area (in sq. units) of the region $\{(x, y), x \geq 0, y \geq 0, y \geq x - 2, \text{ and } y \leq \sqrt{x}\}$ is

A. $\frac{10}{3}$

B. $\frac{13}{3}$

C. $\frac{5}{3}$

D. $\frac{8}{3}$

**Answer: A**

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**21.** Let $g(x) = \cos x^2$, $f(x) = \sqrt{x}$, and $\alpha, \beta(\alpha < \beta)$ be the roots of the quadratic equation $18x^2 - 9\pi x + \pi^2 = 0$. Then the area (in sq. units) bounded by the curve $y = (gof)(x)$ and the lines $x = \alpha, x = \beta$ and $y = 0$ is

A. $\frac{1}{2}(\sqrt{3} + 1)$

B. $\frac{1}{2}(\sqrt{3} - \sqrt{2})$

C. $\frac{1}{2}(\sqrt{2} - 1)$

D. $\frac{1}{2}(\sqrt{3} - 1)$

**Answer: D**

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**22.** The area (in sq. units) bounded by the parabola $y = x^2 - 1$, the tangent at the point (2,3) to it and the y-axis is

A. $\frac{14}{3}$

B. $\frac{56}{3}$

C. $\frac{8}{3}$

D. $\frac{32}{3}$

**Answer: C**

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**23.** The area of the region $A = \{(x, y), 0 \leq y \leq x|x| + 1 \text{ and } -1 \leq x \leq 1\}$ in sq. units, is

A. $\frac{2}{3}$

B. $\frac{1}{3}$

C. 2

D. $\frac{4}{3}$

**Answer: C**

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**24.** If the area enclosed between the curves $y = kx^2$ and $x = ky^2$, where $k > 0$, is 1 square unit. Then k is: (a) $\frac{1}{\sqrt{3}}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{2}{\sqrt{3}}$ (d) $\sqrt{3}$

A. $\frac{1}{\sqrt{3}}$

B. $\frac{2}{\sqrt{3}}$

C. $\frac{\sqrt{3}}{2}$

D. $\sqrt{3}$

**Answer: A**

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**25.** Let $I = \int_a^b (x^4 - 2x^2)dx$. If I is minimum then the ordered pair (a, b) is:

A. $(-\sqrt{2}, 0)$

B. $(-\sqrt{2}, \sqrt{2}$

C. $(0, \sqrt{2})$

D. $(\sqrt{2}, -\sqrt{2})$

**Answer: B**

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**26.** The area of the region bounded by the curve $x^2 = 4y$ and the straight line $x = 4y - 2$ is

A. $\frac{5}{4}$

B. $\frac{9}{8}$

C. $\frac{3}{4}$

D. $\frac{7}{8}$

**Answer: B**

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**27.** The area (in sq units) of the region bounded by the parabola, $y = x^2 + 2$ and the lines, $y = x + 1$, $x = 0$ and $x = 3$, is

A. $\frac{15}{4}$

B. $\frac{15}{2}$

C. $\frac{21}{2}$

D. $\frac{17}{4}$

**Answer: B**

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**28.** The area (in sq units) in the first quadrant bounded by the parabola, $y = x^2 + 1$, the tangent to it at the point (2, 5) and the coordinate axes is

A. $\frac{14}{3}$

B. $\frac{187}{24}$

C. $\frac{37}{24}$

D. $\frac{8}{3}$

**Answer: C**

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## Question From Previous Years B Architecture Entrance Examination Papers

**1.** The area enclosed by the parabola $y = 3(1 - x^2)$ and the x-axis is

A. 4

B. 3

C. 9

D. 2

**Answer: A**

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**2.** The line $y = x + 1$ divided the area the curves $y = \cos x, \left[ -\frac{\pi}{2}, \frac{\pi}{2} \right]$ and the x-axis into two regions which are in the ratio

A. $2:1$

B. $1:3$

C. $2:3$

D. $1:1$

**Answer: B**

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**3.** Find the area enclosed by the curves $x^2 = y, y = x + 2, and x - a\xi s.$

A. $\frac{5}{4}$

B. $\frac{5}{2}$

C. $\frac{15}{4}$

D. $\frac{5}{6}$

**Answer: D**

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

A. $2\frac{1}{6}$

B. $1\frac{1}{3}$

C. $\frac{1}{3}$

D. $2\frac{5}{6}$

**Answer: C**

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**5.** Find the area of region $\{(x, y): 0 \leq y \leq x^2 + 1, 0 \leq y \leq x + 1, 0 \leq x \leq 2\}$.

A. $\frac{23}{3}$

B. $\frac{21}{6}$

C. $\frac{23}{6}$

D. $\frac{15}{2}$

**Answer: C**

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**6.** The area of the region bounded by curves $y = 1 - x^2, x + y + 1 = 0$ and $x - y - 1 = 0$ is

A. $\frac{10}{3}$

B. $\frac{7}{3}$

C. $\frac{8}{3}$

D. 3

**Answer: B**

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**7.** Find the ratio in which the area bounded by the curves $y^2 = 12x and x^2 = 12y$ is divided by the line $x = 3$.

A. $\frac{147}{4}$

B. $\frac{45}{4}$

C. $\frac{137}{4}$

D. $\frac{245}{4}$

**Answer: A**

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**8.** The area (in sq units) of the region bounded by the curve $y = \sqrt{x}$ and the lines $y = 0, y = x - 2,$ is

A. $\frac{10}{3}$

B. $\frac{8}{3}$

C. $\frac{4}{3}$

D. $\frac{16}{3}$

**Answer: A**

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**9.** If the line x=a bisects the area under the curve $y = \frac{1}{x^2}, 1 \leq x \leq 9$, then a is equal to

A. $\frac{9}{5}$

B. $\frac{5}{9}$

C. $\frac{9}{4}$

D. $\frac{4}{9}$

**Answer: A**

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**10.** If the line, $y = mx$ bisects the area of the region $\left\{(x, y) : 0 \leq x \leq \frac{3}{2}, 0 \leq y \leq 1 + 4x - x^2\right\}$, then m equals:

A. $\frac{39}{16}$

B. $\frac{9}{8}$

C. $\frac{13}{3}$

D. $\frac{13}{6}$

**Answer: D**

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**11.** The area (in sq. units) of the region bounded by the curve $12y = 36 - x^2$ and the tangents drawn to it at the points, where the curve intersects the x-axis is

A. 12

B. 18

C. 27

D. 6

**Answer: A**

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**12.** The area (in sq. units) of the region bounded by the curve $\sqrt{x}+\sqrt{y}=1, x, y, \geq 0$ and the tangent to it at the point $\left(\frac{1}{4}, \frac{1}{4}\right)$ is

A. $\frac{1}{36}$

B. $\frac{1}{8}$

C. $\frac{1}{12}$

D. $\frac{1}{24}$

**Answer: D**

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