# MATHS

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# MATHS (KANNADA ENGLISH)

# AREA UNDER CURVES

## Multiple Choice Questions Level I

**1.** The area bounded by the circle $x^2 + y^2 = 2$ is equal to :

A. $4\pi$ sq. units

B. $2\sqrt{2}\pi$ sq.units

C. $4\pi^2$ sq. units

D. $2\pi$ sq. units

**Answer: D**

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**2.** The area of the region bounded by the curve $y = x^2$ and the line y = 16 is

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

B. $\frac{256}{3}$

C. $\frac{64}{3}$

D. $\frac{128}{3}$

**Answer: B**

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**3.** The area of the region bounded by the parabola $y^2 = x$ and the straight line 2y=x is :

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

B. 1 sq. unit

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

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

**Answer: A**

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**4.** The area of the region bounded by the curve y=sin x between the ordinates x=0, $x = \frac{\pi}{2}$ and the x-axis is :

A. 2 sq. units

B. 4 sq. units

C. 3 sq. units

D. 1 sq. unit

**Answer: D**

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**5.** The area of the region bounded by the curve $y = \sqrt{16 - x^2}$ and x -axis is :

A. $8\pi$ sq. units

B. $20\pi$ sq. units

C. $16\pi$ sq. units

D. $256\pi$ sq. units

**Answer: A**

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**6.** The area bounded by the curve $y = x^2$, the x-axis and the line $x = 2^{1/3}$ is divided into

two equal area by the line x=k. The value of k is

:

A. $2^{1/3} - 1$

B. 1

C. $2^{-2/3}$

D. $2^{-1/3}$

**Answer: B**

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**7.** The area $\{(x, y) : |x| \geq y \geq x^2\}$ is equal to

:

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

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

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

D. None of these

**Answer: B**

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**8.** The area $\{(x, y) : x^2 \leq y \leq \sqrt{x}\}$ is equal to

:

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

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

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

D. None of these

**Answer: A**

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**9.** The area enclosed between the curves $y = x^2$ and $x = y^2$ is :

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

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

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

D. None of these

**Answer: A**

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**10.** The area enclosed between the curves $y^2 = 4x$ and the line y=x is

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

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

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

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

**Answer: A**

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**11.** Area enclosed between the curve $y = x^{1/3}$, the y-axis and the lines y=-1 , y=1 is :

A. 0

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

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

D. None of these

**Answer: B**

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**12.** Find the area of the parabola $y^2 = 4ax$ bounded by its latus rectum.

A. $\frac{8}{3}a^2$

B. $\frac{16}{3}a^2$

C. $\frac{4}{3}a^2$

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

**Answer: A**

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**13.** The area between the hyperbola $xy = c^2$, the x-axis and the ordinates at a and b with a > b , is :

A. $c^2 \log\left(\frac{a}{b}\right)$

B. $c^2 \log\left(\frac{b}{a}\right)$

C. $c^2 \log(ab)$

D. None of these

**Answer: B**

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

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

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

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

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

**Answer: A**

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**15.** The area enclosed by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is :

A. $\pi^2 ab$

B. $\pi ab$

C. $\pi a^2 b$

D. $\pi ab^2$

**Answer: C**

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**16.** If the area bounded by the curve y=f(x), the coordinate axes and the line $x = x_1$ is given by $x_1 . e^{x_1}$ , then f(x) is equal to

A. $xe^x - e^x$

B. $xe^x + e^x$

C. $e^x$

D. $xe^x$

**Answer: B**

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**17.** The area between $\frac{x^2}{a^2}+\frac{y^2}{b^2}$=1 and st.line $\frac{x}{a}+\frac{y}{b}=1$ is : x

A. $\frac{1}{4}\pi ab-\frac{1}{2}ab$

B. $\frac{1}{4}ab$

C. $\frac{1}{2}ab$

D. $\frac{1}{2}\pi ab$

**Answer: A**

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**18.** The area of the figure bounded by y=sin x , y cos x in the first quadrant is :

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

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

C. $\sqrt{3}+1$

D. None of these

**Answer: D**

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**19.** The area bounded by the curves $y = xe^x, y = xe^{-x}$ and the line x=1 is :

A. $1 - \frac{1}{e}$

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

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

D. $1 - \frac{2}{e}$

**Answer: C**

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**20.** The area bounded by the curve $y = x^3$ , x-axis and two ordinates x=1 and x=2 is equals to :

A. $\frac{15}{2}$ sq. units

B. $\frac{15}{4}$ sq. units

C. $\frac{17}{2}$ sq. units

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

**Answer: B**

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**21.** The area bounded by the curve $y = 4x - x^2$ and the x-axis is :

A. $\frac{30}{7}$ sq. units

B. $\frac{31}{7}$ sq. units

C. $\frac{32}{3}$ sq. units

D. $\frac{34}{3}$ sq. units

**Answer: C**

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**22.** Area between the curve $y = 4 + 3x - x^2$ and x-axis in square units is :

A. $\frac{125}{3}$

B. $\frac{125}{4}$

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

D. None of these

**Answer: C**

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**23.** Area bounded by the curve y=x sin x and x - axis between x=0 and x=2$\pi$ is :

A. $2\pi$

B. $3\pi$

C. $4\pi$

D. None of these

**Answer: C**

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**24.** The area bounded by the curve $y = 2x - x^2$ and the st.line y=-x is given by :

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

B. $\frac{43}{6}$

C. $\frac{35}{6}$

D. None of these

**Answer: A**

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

A. 2

B. 1

C. 4

D. 3

**Answer: B**

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## Multiple Choice Questions Level Ii

**1.** The area bounded by the curve $y = e^x, y = e^{-x}$ and the ordinates x=0 and x=2 is :

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

B. $e^2 - \frac{1}{e^2}$

C. $\left(e + \frac{1}{e}\right)^2$

D. None of these

**Answer: A**

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**2.** Area enclosed by y=1 and $\pm$ 2x+y=2 (in square units) is :

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

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

C. 1

D. 2

**Answer: A**

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

A. 1

B. 2

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

D. None of these

**Answer: A**

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**4.** Area common to the circle $x^2 + y^2 = 64$ and the parabola $y^2 = 12x$ is :

A. $\frac{16}{3}(4\pi + \sqrt{3})$

B. $\frac{16}{3}(8\pi - \sqrt{3})$

C. $\frac{16}{3}(4\pi - \sqrt{3})$

D. None of these

**Answer: A**

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**5.** The area enclosed between the curves y = $x^3$ and $y = \sqrt{x}$ is, (in square units)

A. $\frac{5}{12}$

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

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

D. None of these

**Answer: A**

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**6.** One value of k for which the area of the figure bounded by the curve $y = 8x^2 - x^5$, the st. lines x=1 and x=k and x-axis is equal to $\frac{16}{3}$ is :

A. $-1$

B. 3

C. 2

D. $\sqrt[3]{8 - \sqrt{17}}$

**Answer: D**

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**7.** The area of the figure bounded by the curves $y = e^x$, $y = e^{-x}$, and st. line x=1 is :

A. $e + \frac{1}{e} - 2$

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

C. $e - \frac{1}{e}$

D. None of these

**Answer: A**

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

A. 3

B. 6

C. 9

D. None of these

**Answer: C**

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**9.** The triangle formed by the tangent to the curve $f(x) = x^2 + bx - b$ at the point (1,1) and the coordinate axes, lies in the first quadrant , if its area is 2, then the value of b is :

A. $-1$

B. $3$

C. $-3$

D. 1

**Answer: C**

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**10.** The area bounded by the curves : $y=|x|-1$ and $y=-|x|+1$ is :

A. 1

B. 2

C. $2\sqrt{2}$

D. 4

**Answer: B**

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**11.** The area of the region bounded by the curves : $y=|x-1|$ and $y=3-|x|$ is :

A. 3 sq. units

B. 4 sq. units

C. 6 sq. units

D. 2 sq. units

**Answer: B**

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**12.** Area bounded by the curves : $y = \sqrt{x}, x = 2y + 3$ in the first quadrant and x-axis is :

A. $2\sqrt{3}$

B. 18

C. 9

D. $\frac{34}{3}$

**Answer: C**

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**13.** The area of the region bounded by the curves : $y=|x-2|$, $x=1$,$x=3$ and the x-axis is :

A. 1

B. 2

C. 3

D. 4

**Answer: A**

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**14.** Area enclosed between curves : $y = ax^2$ and $x = ay^2$ (a > 0) is 1 sq. unit, then a is :

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

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

C. $1$

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

**Answer: A**

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**15.** The area enclosed between the curves : $y^2 = x$ and y=|x| is :

A. 1

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

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

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

**Answer: B**

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**16.** Let f(x) be a non-negative continuous function such that the area bounded by the curve y=f(x), x-axis and the ordinates $x = \frac{\pi}{4}$ and $x = \beta > \frac{\pi}{4}$ is :

$\left(\beta \sin \beta + \frac{\pi}{4}\cos \beta + \sqrt{2}\beta\right)$.

Then $f\left(\frac{\pi}{2}\right)$ is :

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

B. $\left(\frac{\pi}{4} + \sqrt{2} - 1\right)$

C. $\left(1 - \frac{\pi}{4} + \sqrt{2}\right)$

D. $\left(1 - \frac{\pi}{4} - \sqrt{2}\right)$

**Answer: C**

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**17.** The parabolas $y^2 = 4x$ and $x^2 = 4y$ divide the square region bounded by the lines x=4 , y=4 and the coordinate axes. If $S_1, S_2, S_3$ are respectively the areas of these parts numbered from top to bottom , then $S_1 : S_2 : S_3$ is :

A. $1 : 2 : 3$

B. $1:2:1$

C. $1:1:1$

D. $2:1:2$

**Answer: C**

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**18.** Find the area bounded the curves : $y=(x-1)^2, y=(x+1)^2$ and $y=\frac{1}{4}$

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

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

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

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

**Answer: B**

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**19.** The area of the plane region bounded by the curves $x + 2y^2 = 0$ and $x + 3y^2 = 1$ is equal to :

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

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

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

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

**Answer: A**

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**20.** The area of the region between the curves

: $y = \sqrt{\frac{1+\sin x}{\cos x}}$ and $y = \sqrt{\frac{1-\sin x}{\cos x}}$

bounded by the lines x=0 and $x = \frac{\pi}{4}$ is :

A. $\int_0^{\sqrt{2}-1} \frac{1}{(1+t^2)\sqrt{1-t^2}} dt$

B. $\int_0^{\sqrt{2}+1} \frac{4t}{(1+t^2)\sqrt{1-t^2}} dt$

C. $\int_0^{\sqrt{2}-1} \frac{4t}{(1+t^2)\sqrt{1-t^2}} dt$

D. $\int_0^{\sqrt{2}+1} \frac{t}{(1+t^2)\sqrt{1-t^2}} dt$

**Answer: C**

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**21.** 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. 3

B. 6

C. 9

D. 12

**Answer: C**

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

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

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

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

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

**Answer: A**

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**2.** The area of the region enclosed by the curves : y=x ,x=e , $y = \frac{1}{x}$ and the positive x-axis is :

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

B. 1 square unit

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

D. $\frac{5}{2}$ square units

**Answer: C**

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**3.** Let the straight line x=b divide the area enclosed by $y = (1-x)^2$, $y = 0$ and x=0 into two parts $R_1(0 \leq x \leq b)$ and $R_2(b \leq x \leq 1)$ such that $R_1 - R_2 = \frac{1}{4}$ .Then b equals :

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

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

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

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

**Answer: B**

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**4.** Let f:[-1,2] $\rightarrow$ [0 , $\infty$) be a continuous function such that f(x)=f(1-x) for all x $\in$ [-1,2]. Let $R_1 = \int_{-1}^{2} x f(x) dx$ and $R_2$ be the area of the region bounded by the y=f(x), x=-1 , x=2 and the x-axis .Then :

A. $R_1 = 2R_2$

B. $R_1 = 3R_2$

C. $2R_1 = R_2$

D. $3R_1 = R_2$

**Answer: C**

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

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

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

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

D. 0

**Answer: B**

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

A. $20\sqrt{2}$

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

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

D. $10\sqrt{2}$

**Answer: C**

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**7.** The area (in square units) 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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**8.** The area enclosed by the curves y=sin x + cos x and y |cos x -sin x| over the interval $[0, \pi/2]$ is :

A. $4\left(\sqrt{2}-1\right)$

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

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

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

**Answer: B**

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**9.** 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. $\frac{\pi}{2} - \frac{2}{3}$

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

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

**Answer: D**

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**10.** The area (in sq. units) of the region described by : {(x,y):$y^2 \leq 2x$ and $y \geq 4x - 1$ } is :

A. $\frac{4}{32}$

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

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

D. $\frac{9}{32}$

**Answer: D**

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**1.** The area of the region bounded by the curves : $y = x^2$ and $y = 4x - x^2$ in sq. units is :

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

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

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

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

**Answer: C**

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**2.** The area bounded by the curve : $y = \begin{cases} x^2 & x < 0 \\ x & x \geq 0 \end{cases} +$ and the line y=4 is :

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

B. $\frac{40}{3}$

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

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

**Answer: B**

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**3.** If the area between $y = mx^2$ and $x = my^2$ (m > 0) is $\frac{1}{4}$ sq. unit, then the value of m is :

A. $\pm 3\sqrt{2}$

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

C. $\sqrt{2}$

D. $\sqrt{3}$

**Answer: B**

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**4.** The area bounded by the curve $y = \sin\left(\frac{x}{3}\right)$, $x$-axis and lines x=0 and $x = 3\pi$ is

A. 9

B. 0

C. 6

D. 3

**Answer: C**

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**5.** Area bounded by $y = x^3, y = 8$ and $x = 0$ is _____.

A. 2 sq. units

B. 14 sq. units

C. 12 sq. units

D. 6 sq. units

**Answer: C**

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**6.** Area bounded by the curve $y = x^3$ , the x-axis and the ordinates x=-2 and x=1 , is :

A. $-9$ sq. units

B. $-\frac{15}{4}$ sq. units

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

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

**Answer: D**

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**7.** The area in square units bounded by the normal at (1,2) to the parabola $y^2 = 4x$, x-axis and the curve is given by :

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

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

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

D. None of these

**Answer: A**

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**8.** The area of the region bound by Y-axis, y = cos x and y = sin x, $0 \leq x \leq \frac{\pi}{2}$ is

A. $\sqrt{2}-1$

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

C. $\sqrt{2}+1$

D. $\sqrt{2}$

**Answer: A**

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**9.** The area in square units of the region bounded by $y^2 = 9x$ and $y = 3x$ is :

A. 2

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

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

D. 1

**Answer: C**

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