MATHS

BOOKS - TARGET MATHS (HINGLISH)

APPICATIONS OF DEFINITE INTEGRAL

Classical Thinking

1. Area bounded by the curve $y = x^3$, X-axis and ordiantes x=1 and x=4 is

A. 64 sq. units

B. 27 sq. units

C. $\frac{127}{4}$ sq. units

D. $\frac{255}{4}$ sq. units

Answer: D

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2. Area bounded by the curve xy=c, X-axis between x=1, x=4 is

A. c log3 sq. units

B. 2logc sq. units

C. 2c log2 sq. units

D. 2c log5 sq. units

Answer: C

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3. Area under the curve $y = \sqrt{3x + 4}$ between x=0 and x=4 is

A. $\frac{56}{9}$ sq. units

B. $\frac{64}{9}$ sq. units

C. 8 sq. units

D. $\frac{112}{9}$ sq. units

Answer: D

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4. The area bounded by $y = 1 + \frac{8}{x^2}$, X-axis and the ordinates x=2, x=4 is

A. 2

B. 4

C. log 2

D. log 4

Answer: B

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5. The area bounded by the curve $y = \log x$, x- axis and the ordinates $x = 1, x = 2$ is

A. log4 sq. units

B. (log4+1) sq. units

C. (log4-1) sq. units

D. log 2 sq. units

Answer: C

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6. 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. 1

B. 2

C. 3

D. 4

Answer: A

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7. The area of the region bounded by the parabola $y = 4x - x^2$, the X-axis, x=0 and x=2 is

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

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

C. $\frac{16 - \sqrt{2}}{3}$

D. $\frac{8 + \sqrt{2}}{3}$

Answer: B

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8. The area under y=2x+sinx between y=0, x=0 and $x=\frac{\pi}{2}$ is

A. $\frac{\pi^2}{4}+1$

B. $\frac{\pi^2}{4}$

C. $\frac{\pi^2}{4}-1$

D. $\frac{\pi^2}{3}+1$

Answer: A

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9. Find the area bounded by the curve $y = xe^{x^2}$, x-axis and the ordinates x=0 and x=h.

A. $\frac{e^{x^2}+1}{2}$ sq. units

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

C. $\left(c^{a^2}+1\right)$ sq. units

D. $\left(x^{a^2}-1\right)$ sq. units

Answer: B

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10. Area enclosed by the curve $y = \sin^2 x$, the X-axis and the lines $x = 0, x = \pi/2$ is

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

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

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

D. π

Answer: B

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11. The area in square units of the region bounded by the curve $x^2 = 4y$, the line x=2 and the x-axis, is

A. 1

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

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

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

Answer: B

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Critical Thinking

1. The area bounded by the parabola $y = 4x^2, x = 0$ and $y = 1, y = 4$ is

A. 3 sq. units

B. $\frac{7}{5}$ sq. units

C. $\frac{7}{3}$ sq. units

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

Answer: C

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2. The area of the region bounded by $x^2 = y - 2, y = 4, y = 6$ and the Y-axis in the first quadrant is

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

B. $\frac{2}{3}(8 - \sqrt{2})$

C. $\frac{2}{3}(8 - 2\sqrt{2})$

D. $\frac{3}{2}(8 - \sqrt{2})$

Answer: C

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3. The area of the region bounded by $y^2 = 4x, x = 0, x = 4$ and the X-axis in the first quadrant is

A. 16

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

C. 32

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

Answer: D

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4. The ratio of the areas between the curves $y = \cos x$ and $y = \cos 2x$ and x-axis from $x = 0$ to $x = \frac{\pi}{3}$ is

A. $\sqrt{2}:1$

B. $1:1$

C. $1:2$

D. $2:1$

Answer: D

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5. The area of the region bounded by the curve $xy - 3x - 2y - 10 = 0$, X-axis and the lines $x = 3, x = 4$, is

A. 16 log 2 - 13 sq. units

B. 16 log 2 - 3 sq. units

C. 16 log 2 + 3 sq. units

D. 16 log 2 - 10 sq. units

Answer: C

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6. If the area bounded by $y = 3x^2 - 4x + k$, the X-axis and x=1, x=3 is 20 sq. units, then the value of k is

A. 2

B. 3

C. 5

D. 7

Answer: C

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

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

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

C. $\frac{125}{2}$

D. 125

Answer: A

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8. The area of the region bounded by $x = y^2 - y$ and Y-axis is

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

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

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

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

Answer: D

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9. The area bounded by the parabola $y = 4x - x^2$ and 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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10. The area bounded by the curve $y = f(x)$, X-axis and ordinates x=1 and x=b is $(b-1)\sin(3b+4)$, find $f(x)$.

A. 3(x-1)cos(3x+4)+sin(3x+4)

B. (b-1)sin(3x+4)+3cos(3x+4)

C. (b-1)cos(3x+4)+3sin(3x+4)

D. (x-1)sin(3x+4)+3cos(3x+4)

Answer: A

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11. Area enclosed between the curve $y^2(2a - x) = x^3$ and line $x = 2a$ above X-axis is

A. πa^2

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

C. $2\pi a^2$

D. $3\pi a^2$

Answer: B

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12. Area bounded by the parabola $y^2 = 2x$ and the ordinates x=1, x=4 is

A. $\frac{4\sqrt{2}}{3}$ sq. units

B. $\frac{28\sqrt{2}}{3}$ sq. units

C. $\frac{56}{3}$ sq. units

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

Answer: B

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13. The area bounded by the curve $y^2 = 8x$ and the line x=2 is

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

B. $\frac{23}{3}$ sq. units

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

D. $\frac{13}{2}$ sq. units

Answer: A

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14. Examples: Find the area bounded by the parabola $y^2 = 4ax$ and its latus rectum.

A. $\frac{2}{3}a^2$ sq. units

B. $\frac{4}{3}a^2$ sq. units

C. $\frac{8}{3}a^2$ sq. units

D. $\frac{3}{8}a^2$ sq. units

Answer: C

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15. The area bounded by the curve $x = 4 - y^2$ and the Y-axis is

A. 16 sq. units

B. 32 sq. units

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

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

Answer: C

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16. The area enclosed by the parabola $y = x^2 - 1$ and $y = 1 - x^2$ is

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

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

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

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

Answer: D

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17. The area of the region bounded by the X-axis and the curves defined by y=tan x, $\left(-\frac{\pi}{3} \leq x \leq \frac{\pi}{3}\right)$ is

A. $\log \sqrt{2}$

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

C. 2log 2

D. 0

Answer: C

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18. The area of the region bounded by the curve $y=\cos x$, X-axis and the lines $x=0$, $x=2\pi$ is

A. 2

B. 4

C. 0

D. 3

Answer: B

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19. Find the area of the region bounded by the curve $y = \sin x$ between $x = 0$ and $x = 2\pi$.

A. 2 sq. units

B. 4 sq. units

C. 8 sq. units

D. 16 sq. units

Answer: B

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20. The area of smaller part between the circle $x^2 + y^2 = 4$ and the line x=1 is

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

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

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

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

Answer: B

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21. The area of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is

A. πab sq. units

B. $\frac{1}{2}\pi ab$ sq. units

C. $\frac{1}{4}\pi ab$ sq. units

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

Answer: A

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22. A tangent to the ellipse $16x^2 + 9y^2 = 144$ making equal intercepts on both the axes is

A. 8π

B. 80π

C. 20π

D. 12π

Answer: D

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23. Find the area bounded by the curve $y = x|x|$, x-axis and ordinates $x = -1$ and $x = 1$.

A. 0

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

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

D. 1

Answer: C

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24. Find the area bounded by the curve $y = 3x + 2$, x-axis and ordinate $x = -1$ and $x = 1$.

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

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

C. $\frac{13}{2}$

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

Answer: A

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25. Area lying in the first quadrant and bounded by the circle $x^2 + y^2 = 4$ the line $x = \sqrt{3}y$ and x-axis , is

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

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

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

D. π

Answer: C

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26. Area bounded by the lines $y = 2 + x, y = 2 - x$ and $x = 2$ is (A) 3 (B) 4 (C) 8 (D) 16

A. 3 sq. units

B. 4 sq. units

C. 8 sq. units

D. 16 sq. units

Answer: B

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27. The area of the region bounded by $y=7x+1$, $y=5x+1$ and $x=3$ is

A. 2 sq. units

B. 4 sq. units

C. 6 sq. units

D. 9 sq. units

Answer: C

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28. For $0 \leq x \leq \pi$, the area bounded by $y = x$ and $y = x + \sin x$, is

A. 2

B. 4

C. 2π

D. 4π

Answer: A

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29. The area bounded by the curves $y^2 - x = 0$ and $y - x^2 = 0$ is

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

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

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

D. 1

Answer: B

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30. Find the area included between the curves $x^2 = 4y$ and $y^2 = 4x$.

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

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

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

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

Answer: D

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31. If the area enclosed between the curves $y = ax^2 and x = ay^2 (a > 0)$ is 1 square unit, then find the value of a.

A. 1

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

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

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

Answer: B

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32. Find the area bounded by the curve $4y^2 = 9x$ and $3x^2 = 16y$

A. 4 sq. units

B. 2 sq. units

C. 16 sq. units

D. 8 sq. units

Answer: A

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33. The area common to the parabolas $y = 2x^2$ and $y = x^2 + 4$ (in square units) is (A) $\frac{2}{3}$ (B) $\frac{3}{2}$ (C) $\frac{32}{3}$ (D) $\frac{3}{32}$

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

B. $\frac{26}{3}$

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

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

Answer: A

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34. The area bounded by the curves $4y = x^2$ and $2y = 6 - x^2$ is

A. 8

B. 6

C. 4

D. 10

Answer: A

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35. The area of the region bounded by the parabola $y^2 = 4ax$ and the line y=mx is

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

B. $\frac{8m^2}{3a^3}$

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

D. $\frac{8a^2m^3}{3}$

Answer: A

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36. The area bounded by the parabola $x^2 = 2y$ and the line y=3x is

A. 4 sq. units

B. 18 sq. units

C. 24 sq. units

D. 32 sq. units

Answer: B

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37. Area enclosed between the curve $y = x^2$ and the line y = x is

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

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

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

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

Answer: A

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

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

B. 1

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

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

Answer: A

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39. The area enclosed between the curves $y = x^3$ and $y = \sqrt{x}$ is

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

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

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

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

Answer: C

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40. The area enclosed by the parabola $y = x^2 - 1$ and $y = 1 - x^2$ is

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

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

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

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

Answer: D

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41. The area enclosed between the curves $y = x$ and $y = 2x - x^2$ (in square units), is

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

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

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

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

Answer: B

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42. Find the area bounded by the curve $x^2 = 4y$ and the straight line $x = 4y - 2$.

A. $\frac{8}{9}$ sq. units

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

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

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

Answer: B

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43. If area bounded by the curve $y^2 = 4ax$ and $y = mx$ is $a^2/3$, then the value of m, is

A. 2

B. 1

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

D. 0

Answer: A

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44. What is the area bounded by the curves $y = e^x, y = e^{-x}$ and the straight line $x = 1$?

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

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

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

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

Answer: C

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45. Compute the area of the figure bounded by the straight lines $= 0, x = 2$ and the curves $y = 2^x, y = 2x - x^2$.

A. $\frac{4}{3} - \frac{1}{\log 2}$

B. $\frac{3}{\log 2} + \frac{4}{3}$

C. $\frac{4}{\log 2} - 1$

D. $\frac{3}{\log 2} - \frac{4}{3}$

Answer: D

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46. The area bounded by the curves $y = (\log)_e x and y = \left((\log)_e x\right)^2$ is $e - 2 sq units$

(b) $3 - e sq units$ $e sq units$ (d) $e - 1 sq units$

A. 3-e

B. e-3

C. $\frac{1}{2}(3 - e)$

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

Answer: A

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

A. 2

B. 1

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

D. 3

Answer: B

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

A. $\frac{1}{2}(\pi-2)$ sq. units

B. $\frac{3}{2}(\pi-2)$ sq. units

C. $\frac{5}{4}(\pi-2)$ sq. units

D. $\frac{2}{3}(\pi-2)$ sq. units

Answer: B

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Competitive Thinking

1. The area enclosed by y = 3x - 5, y = 0, x = 3 and x = 5 is

A. 12 sq. units

B. 13 sq. units

C. $13\frac{1}{2}$ sq. units

D. 14 sq. units

Answer: D

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2. The area of the region bounded by the lines $y = mx$, $x = 1$, $x = 2$ and X-axis is 6 sq units, then m is equal to

A. 3

B. 1

C. 2

D. 4

Answer: D

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3. Area of the region bounded by rays $|x| + y = 1$ and X-axis is

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

B. 2

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

D. 1

Answer: D

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4. The area of the region bounded by the lines $y=2x+1y=3x+1$ and $x=4$ is

A. 16 sq. units

B. $\frac{121}{3}$ sq. units

C. $\frac{121}{6}$ sq. units

D. 8 sq. units

Answer: D

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5. Find the area bounded by the line $y = x$, the x-axis and the ordinates $x = -1$ and $x = 2$

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

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

C. 2

D. 3

Answer: B

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6. The area of the region bounded by the curve $y = x^3$, and the lines , y=8 and x=0, is

A. 16

B. 8

C. 10

D. 12

Answer: D

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7. The area of the region bounded by the curve $y = |x - 2|, x = 1, x = 3$ and the X-axis is

A. 4

B. 2

C. 3

D. 1

Answer: D

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

A. 3 sq. units

B. 4 sq. units

C. 1 sq. units

D. 2 sq. units

Answer: C

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9. Find by integration the area of the region bounded by the curve $y = 2x - x^2$ and the x-axis.

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

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

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

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

Answer: B

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10. The area (in sq. units) of the region bounded by the X-axis and the curve $y = 1 - x - 6x^2$ is

A. $\frac{125}{216}$

B. $\frac{125}{512}$

C. $\frac{25}{216}$

D. $\frac{25}{512}$

Answer: A

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11. The area bounded by the curves $y = -x^2 + 3$ and $y = 0$ is

A. $\sqrt{3} + 1$

B. $\sqrt{3}$

C. $4\sqrt{3}$

D. $5\sqrt{3}$

Answer: C

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12. If A is the area of the region bounded by the curve $y = \sqrt{3x + 4}$, x axis and the line $x = -1$ and $x = 4$ and B is that area bounded by curve $y^2 = 3x + 4$, x- axis and the lines $x = -1$ and $x = 4$ then $A : B$ is equal to

A. $1 : 1$

B. $2 : 1$

C. $1 : 2$

D. None of these

Answer: A

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13. The area bounded by the x-axis, the curve $y = f(x)$, and the lines $x = 1, x = b$ is equal to $\sqrt{b^2+1} - \sqrt{2}$ for all $b > 1$, then $f(x)$ is $\sqrt{x-1}$ (b) $\sqrt{x+1}\sqrt{x^2+1}$ (d) $\frac{x}{\sqrt{1+x^2}}$

A. $\sqrt{x-1}$

B. $\sqrt{x+1}$

C. $\sqrt{x^2+1}$

D. $\frac{x}{\sqrt{1+x^2}}$

Answer: C

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14. Let $f(x)$ be a non-negative continuous function such that the area bounded by the curve $y = f(x)$, the x-axis, and the ordinates $x = \frac{\pi}{4} and x = \beta > \frac{\pi}{4} is \beta \sin\beta + \frac{\pi}{4} \cos\beta + \sqrt{2}\beta \cdot$ Then $f'\left(\frac{\pi}{2}\right)$ is $\left(\frac{\pi}{2} - \sqrt{2} - 1\right)$ (b) $\left(\frac{\pi}{4} + \sqrt{2} - 1\right) - \frac{\pi}{2}$ (d) $\left(1 - \frac{\pi}{4} - \sqrt{2}\right)$

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

B. $1 - \frac{\pi}{4} - \sqrt{2}$

C. $\frac{\pi}{4} - \sqrt{2} + 1$

D. $\frac{\pi}{4} + \sqrt{2} - 1$

Answer: A

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15. Find the area bounded by the x-axis, part of the curve $y = \left(1 - \frac{8}{x^2}\right)$, and the ordinates at $x = 2 and dx = 4$. If the ordinate at $x = a$ divides the area into two equal parts, then find a.

A. 8

B. $2\sqrt{2}$

C. 2

D. $\sqrt{2}$

Answer: B

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16. If a curve $y = a\sqrt{x} + bx$ passes through the point (1,2) and the area bounded by the curve, line x = 4 and X-axis is 8 sq units, then

A. a=3, b=-1

B. a=3, b=1

C. a=-3, b=1

D. a=-3, b=-1

Answer: A

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17. Let $f:[-1,2]\overrightarrow{0,\infty}$ be a continuous function such that $f(x)=f(1-x)f$ or $allx\in[-1,2]\cdot$ Let $R_1=\int_{-1}^{2}xf(x)dx,$ and R_2 be the area of the region bounded by $y=f(x),x=-1,x=2,$ and the $x-a\xi s$. Then $R_1=2R_2$ (b) $R_1=3R_2$ $2R_1$ (d) $3R_1=R_2$

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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18. Area of the region bounded by $y = \cos x, x = 0, x = \pi$ and X-axis is . . .sq. units.

A. 1 sq. unit

B. 4 sq. units

C. 2 sq. units

D. 3 sq. units

Answer: C

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19. The area bounded by the curve $y = \sin^2 x, 0 \leq x \leq \frac{\pi}{2}$, X axis and the line $x = \frac{\pi}{2}$ is

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

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

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

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

Answer: B

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20. the area included between the curve $xy^2 = a^2(a - x)$ and y -axis is -

A. πa^2

B. $2\pi a^2$

C. $3\pi a^2$

D. $4\pi a^2$

Answer: A

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21. The area of the region bounded by $x^2 = 4y, y = 1, y = 4$ and the Y-axis lying in the first quadrant is . . . . . Square units.

A. $\frac{22}{3}$

B. $\frac{28}{3}$

C. 30

D. $\frac{21}{4}$

Answer: B

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22. Find the area enclosed by the curves $x^2 = y, y = x + 2,$ and $xa\xi s$

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

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

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

D. None of these

Answer: A

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23. The area (in sqaure units) of the region enclosed by the curves $y = x, x = 2, y = \frac{1}{x}$ and the positive x-axis is

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

B. 1 sq. unit

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

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

Answer: C

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24. Area bounded between two latus-rectum of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1, a>b$ is _____.

(where, e is eccentricity of the ellipse)

A. $2b\left(be+a\sin^{-1}e\right)$

B. $8b\left(be+a\sin^{-1}e\right)$

C. $b\left(be + a\sin^{-1} e\right)$

D. $4b\left(be + a\sin^{-1} e\right)$

Answer: A

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25. The area formed by triangular shaped region bounded by the curves $y = \sin x, y = \cos x$ and $x = 0$ is (A) $\sqrt{2} - 1$ (B) 1 (C) $\sqrt{2}$ (D) $1 + \sqrt{2}$

A. $\sqrt{2} - 1$

B. 1

C. $\sqrt{2}$

D. $1+\sqrt{2}$

Answer: A

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26. Find the area of the region included between the parabolas $y^2 = 4axandx^2 = 4ay, wherea > 0.$

A. $\frac{32}{3}a^2$ sq. units

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

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

D. $\frac{16}{3}a^2$ sq. units

Answer: D

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27. The area of the region bounded by the curves $y = x^2$ and $x = y^2$ is

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

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

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

D. 3

Answer: A

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28. Find the area of the figure bounded by the parabolas $x = -2y^2, x = 1 - 3y^2$.

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

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

C. $\frac{3}{7}$ sq. units

D. $\frac{6}{7}$ sq. units

Answer: A

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29. What is the area bounded by the curve $y = x^2$ and the line $y = 16$?

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

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

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

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

Answer: B

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30. Find the area bounded by the parabola $y^2 = 4ax$ and the line $y = 2ax$.

A. $\frac{a^2}{3}$ sq. units

B. $\frac{1}{3a^2}$ sq. units

C. $\frac{1}{3a}$ sq. units

D. $\frac{2}{3a}$ sq. units

Answer: C

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31. Area lying between the curves $y^2 = 2x$ and y=x is

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

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

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

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

Answer: C

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32. The area of the region bounded by the curves $x = y^2 - 2$ and x=y is

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

B. 9

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

D. $\frac{9}{7}$

Answer: C

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33. If the area enclosed between the curves $y = ax^2 and x = ay^2 (a > 0)$ is 1 square unit, then find the value of a.

A. 3

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

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

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

Answer: D

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34. 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. None of these

Answer: A

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35. 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 the areas of these parts numbered from top to bottom, respectively, then

A. $2:1:2$

B. $1:1:1$

C. $1:2:1$

D. $1:2:3$

Answer: B

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36. The area bounded by the curves $y = \sqrt{x}, 2y + 3 = x,$ and x-axis in the 1st quadrant is

A. 9

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

C. 36

D. 18

Answer: A

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37. Let the straight line x= b divide the area enclosed by $y = (1-x)^2, y = 0, \text{ and } x = 0$ 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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38. The area of the region bounded by the curve $y = x^3$, its tangent at (1, 1) and x-axis is

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

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

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

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

Answer: A

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39. The area (in sq. units) enclosed between the curves $y = x^2$ and $y = |x|$ is

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

B. 1

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

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

Answer: D

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40. Area of the region bounded by $y = |x|$ and $y = -|x| + 2$ is

A. 4 sq. units

B. 3 sq. units

C. 2 sq. units

D. 1 sq. units

Answer: C

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

A. 6 sq. units

B. 2 sq. units

C. 3 sq. units

D. 4 sq. units

Answer: D

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42. The area bounded by curve $y = x^2, y = \frac{2}{(1+x^2)}$ in square units is

A. π

B. $\left(\pi - \frac{2}{3}\right)$

C. $\left(\pi - \frac{1}{3}\right)$

D. $\left(\pi + \frac{1}{3}\right)$

Answer: B

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43. Find the area included between the parabola $y = \frac{x^2}{4a}$ and the curve $y = \frac{8a^3}{x^2 + 4a^2}$.

A. $a^2\left(2\pi + \frac{2}{3}\right)$

B. $a^2\left(2\pi - \frac{8}{3}\right)$

C. $a^2\left(\pi + \frac{4}{3}\right)$

D. $a^2\left(2\pi - \frac{4}{3}\right)$

Answer: D

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44. The area of the region $\{(x, y) : x^2 + y^2 \leq 1 \leq x + y\}$, is

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

B. $\frac{\pi^2}{2}$

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

D. $\frac{\pi}{4} - \frac{1}{2}$

Answer: D

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45. The area (in sq. units) of the region

$$\left\{(x, y): y^2 \leq 2x \text{ and } x^2 + y^2 \leq 4x, x \geq 0, y \leq 0\right\},$$

is

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

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

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

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

Answer: A

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46. Area above the X-axis, bounded by the circle $x^2 + y^2 - 2ax = 0$ and the parabola $y^2 = ax$ is

A. $8\pi a^2$

B. $a^2\left(\frac{\pi}{4} - \frac{2}{3}\right)$

C. $\frac{16\pi a^2}{9}$

D. $\pi\left(\frac{27}{8} + 3a^2\right)$

Answer: B

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

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

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

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

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

Answer: C

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

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

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

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

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

Answer: D

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49. The area enclosed (in square units) by the curve $y = x^4 - x^2$, the X-axis and the vertical lines passes through the two minimum points of the curve is

A. $\frac{48\sqrt{2}}{5}$

B. $\frac{5}{48\sqrt{2}}$

C. $\frac{7}{60\sqrt{2}}$

D. $\frac{7}{30\sqrt{2}}$

Answer: D

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Evaluation Test

1. The area bounded by the curve $y = |x|$, X axis and the lines $x = -\pi$ and $x = \pi$ is

A. 2 sq. units

B. 1 sq. unit

C. π^2 sq. units

D. None of these

Answer: C

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2. Find the area bounded by the curve $y = \sin^{-1} x$ and the line $x = 0, |y| = \frac{\pi}{2}$.

A. 2 sq. units

B. 4 sq. units

C. 8 sq. units

D. 16 sq. units

Answer: A

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3. Using integration find area of the region bounded by the curves $y = \sqrt{5 - x^2}$ and $y = |x - 1|$

A. $\left(\frac{5\pi}{4} + \frac{1}{2}\right)$ sq. unit

B. $\left(\frac{3\pi}{4} + \frac{1}{2}\right)$ sq. unit

C. $\left(\frac{5\pi}{4} - \frac{1}{2}\right)$ sq. unit

D. $\left(\frac{3\pi}{4} - \frac{1}{2}\right)$ sq. unit

Answer: C

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4. The area bounded by the curves y = |x| - 1 and $y = -|x| + 1$ is equal to

A. 1

B. 2

C. $2\sqrt{2}$

D. 4

Answer: B

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5. Find the area of the region formed by $x^2 + y^2 - 6x - 4y + 12 \leq 0$. $y \leq x$ and $x \leq \frac{5}{2}$.

A. $\left(\frac{\pi}{6} - \frac{\sqrt{3}+1}{8}\right)$ sq. unit

B. $\left(\frac{\pi}{6} + \frac{\sqrt{3}+1}{8}\right)$ sq. unit

C. $\left(\frac{\pi}{6} - \frac{\sqrt{3}-1}{8}\right)$ sq. unit

D. None of these

Answer: C

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6. The area bounded by the curve $y = 2x - x^2$ and the line y = - x is

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

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

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

D. 9

Answer: B

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7. The area bounded by y=cosx, y=0 and $|x| = 1$ is given by

A. sin 1 sq. unit

B. 2 sin sq. unit

C. 4 sin sq. unit

D. None of these

Answer: B

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8. 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. $\left(4\sqrt{2} - 1\right)$ sq. unit

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

C. $\left(4\sqrt{2} + 2\right)$ sq. unit

D. $\left(4\sqrt{2} - 2\right)$ sq. unit

Answer: D

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9. The area of the region bounded by the parabola $y = x^2 + 2$ and the lines y = x, x = 0 and x = 3 is

A. $\frac{21}{3}$ sq. unit

B. $\frac{17}{2}$ sq. unit

C. $\frac{27}{2}$ sq. unit

D. $\frac{9}{2}$ sq. unit

Answer: A

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10. The area bounded by the curve $x = 2 - y - y^2$ and Y-axis is

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

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

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

D. $\frac{11}{2}$ sq. units

Answer: C

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11. The area of the region bounded by the curves $y^2 = 4a^2(x - 1)$ and the lines x = 1 and y = 4a, is

A. $\frac{21a}{2}$ sq. units

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

C. $\frac{17a}{3}$ sq. units

D. $\frac{16a}{3}$ sq. units

Answer: D

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12. Find the area of the region bounded by the curves $y^2 = x + 1$ and $y^2 = -x + 1$.

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

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

C. 2 sq. units

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

Answer: A

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13. The area of the closed figure bounded by $x = -1, y = 0, y = x^2 + x + 1,$ and the tangent to the curve $y = x^2 + x + 1$ at A(1,3) is

A. $\frac{6}{7}$ sq. unit

B. $\frac{16}{17}$ sq. unit

C. $\frac{7}{6}$ sq. unit

D. $\frac{17}{16}$ sq. unit

Answer: C

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

A. $\left(\frac{2\pi}{3} + \frac{1}{2}\sqrt{3}\right)$ sq. unit

B. $\left(\frac{3\pi}{2} + \frac{2}{2\sqrt{3}}\right)$ sq. unit

C. $\left(\frac{2\pi}{5} + \frac{1}{2\sqrt{5}}\right)$ sq. unit

D. None of these

Answer: A

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15. The slope of the tangent to a curve $y = f(x)$ at $(x, f(x))$ is $2x + 1$. If the curve passes through the point $(1, 2)$ then the area of the region bounded by the curve, the x-axis and the line $x = 1$ is (A) $\frac{5}{6}$ (B) $\frac{6}{5}$ (C) $\frac{1}{6}$ (D) 1

A. $\frac{5}{6}$ sq. unit

B. $\frac{6}{5}$ sq. unit

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

D. 6 sq. unit

Answer: A

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16. The area bounded by $y = \sin^{-1} x, x = \frac{1}{\sqrt{2}}$ and X-axis is

A. $\left(\frac{1}{\sqrt{2}} + 1\right)$ sq. unit

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

C. $\frac{\pi}{4\sqrt{2}}$ sq. unit

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

Answer: D

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17. 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. 4 sq. units

B. 6 sq. units

C. 9 sq. units

D. 12 sq. units

Answer: C

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18. The area of the region bounded by 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. $\int_0^{\sqrt{2}-1} \frac{t}{(1+t^2)\sqrt{1-t^2}} dt$

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: B

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