

13. The region bounded by the x -axis and the part of the graph of $y = \cos x$ between $x = -\frac{\pi}{2}$ and $x = \frac{\pi}{2}$ is separated into two regions by the line $x = k$. If the area of the region for $-\frac{\pi}{2} \leq x \leq k$ is three times the area of the region for $k \leq x \leq \frac{\pi}{2}$, then $k =$

- (A) $\arcsin\left(\frac{1}{4}\right)$ (B) $\arcsin\left(\frac{1}{3}\right)$ (C) $\frac{\pi}{6}$
(D) $\frac{\pi}{4}$ (E) $\frac{\pi}{3}$

23. The area of the region bounded by the curve $y = e^{2x}$, the x -axis, the y -axis, and the line $x = 2$ is equal to

- (A) $\frac{e^4}{2} - e$ (B) $\frac{e^4}{2} - 1$ (C) $\frac{e^4}{2} - \frac{1}{2}$
(D) $2e^4 - e$ (E) $2e^4 - 2$

15. The area of the region bounded by the lines $x = 0$, $x = 2$, and $y = 0$ and the curve $y = e^{\frac{x}{2}}$ is

- (A) $\frac{e-1}{2}$ (B) $e-1$ (C) $2(e-1)$ (D) $2e-1$ (E) $2e$

17. What is the area of the region completely bounded by the curve $y = -x^2 + x + 6$ and the line $y = 4$?

- (A) $\frac{3}{2}$ (B) $\frac{7}{3}$ (C) $\frac{9}{2}$ (D) $\frac{31}{6}$ (E) $\frac{33}{2}$

1. The area of the region between the graph of $y = 4x^3 + 2$ and the x -axis from $x = 1$ to $x = 2$ is

- (A) 36 (B) 23 (C) 20 (D) 17 (E) 9

34. The area of the region in the first quadrant that is enclosed by the graphs of $y = x^3 + 8$ and $y = x + 8$ is

- (A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) $\frac{3}{4}$ (D) 1 (E) $\frac{65}{4}$

1. The area of the region in the first quadrant enclosed by the graph of $y = x(1-x)$ and the x -axis is

- (A) $\frac{1}{6}$ (B) $\frac{1}{3}$ (C) $\frac{2}{3}$ (D) $\frac{5}{6}$ (E) 1

21. The area of the region enclosed by the graphs of $y = x$ and $y = x^2 - 5x + 5$ is

1988

- (A) $\frac{2}{3}$ (B) 1 (C) $\frac{4}{3}$ (D) 2 (E) $\frac{14}{3}$

6. The area of the region enclosed by the curve $y = \frac{1}{x-1}$, the x -axis, and the lines $x = 3$ and $x = 4$ is

1993

- (A) $\frac{5}{36}$ (B) $\ln \frac{2}{3}$ (C) $\ln \frac{4}{3}$ (D) $\ln \frac{3}{2}$ (E) $\ln 6$

1. The area of the region enclosed by the graphs of $y = x^2$ and $y = x$ is

1993
BC

- (A) $\frac{1}{6}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{5}{6}$ (E) 1

16. The area of the region enclosed by the graph of $y = x^2 + 1$ and the line $y = 5$ is

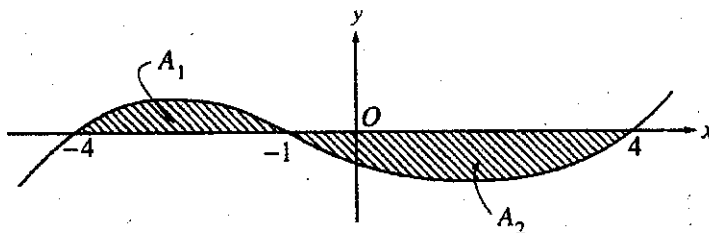
1997

- (A) $\frac{14}{3}$ (B) $\frac{16}{3}$ (C) $\frac{28}{3}$ (D) $\frac{32}{3}$ (E) 8π

83. What is the area of the region in the first quadrant enclosed by the graphs of $y = \cos x$, $y = x$, and the y -axis?

1997

- (A) 0.127 (B) 0.385 (C) 0.400 (D) 0.600 (E) 0.947



1997
BC

19. The graph of $y = f(x)$ is shown in the figure above. If A_1 and A_2 are positive numbers that represent the areas of the shaded regions, then in terms of A_1 and A_2 ,

$$\int_{-4}^4 f(x) dx - 2 \int_{-1}^4 f(x) dx =$$

- (A) A_1 (B) $A_1 - A_2$ (C) $2A_1 - A_2$ (D) $A_1 + A_2$ (E) $A_1 + 2A_2$

25. What is the area of the region between the graphs of $y = x^2$ and $y = -x$ from $x = 0$ to $x = 2$?

998

- (A) $\frac{2}{3}$ (B) $\frac{8}{3}$ (C) 4 (D) $\frac{14}{3}$ (E) $\frac{16}{3}$

92. If $0 \leq k < \frac{\pi}{2}$ and the area under the curve $y = \cos x$ from $x = k$ to $x = \frac{\pi}{2}$ is 0.1, then $k =$

1998

- (A) 1.471 (B) 1.414 (C) 1.277 (D) 1.120 (E) 0.436