

Ms. Islam Ismail

Applications of the Definite Integral**The Practice of Area Between Curves**1. Find the area of the region bounded by $y = x^2$, and $y = 6 - x$

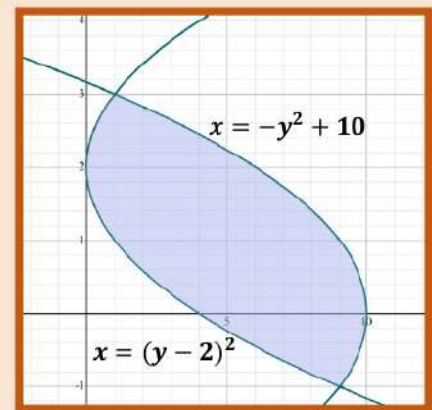
A) $\frac{25}{6}$

B) $\frac{75}{6}$

C) $\frac{125}{3}$

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

2. What is the area of the shaded region



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

B) $\frac{64}{3}$

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

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

3. Find the area of the region bounded by $y = 5x - x^2$, and $y = 2x$

A) $\frac{25}{6}$

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

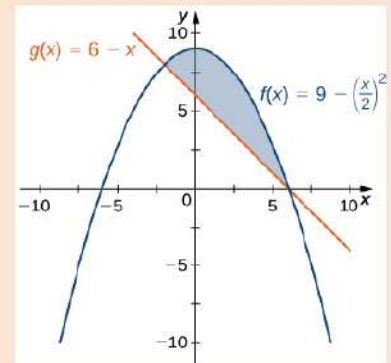
C) $\frac{27}{2}$

D) $\frac{45}{2}$

4. If R is the region bounded above by the graph

of the function $f(x) = 9 - \left(\frac{x}{2}\right)^2$ and

below by the graph of the function $g(x) = 6 - x$,
find the area of region R.



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

B) $\frac{128}{3}$

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

D) $\frac{64}{3}$

5. Find the area bounded by the graphs of $y = -x$, $y = \sqrt{x}$ and $y = 2$. Choose the variable of integration to write the area as a single integral.

A) $A = \int_0^2 (y^2 + y) dy$

B) $A = \int_0^2 (y^2 - y) dy$

C) $A = \int_{-2}^4 (\sqrt{x} + x) dx$

D) $A = \int_{-2}^4 (\sqrt{x} - x) dx$

6. Find the area of the region bounded by $y = x^2$, and $y = 4x - 3$

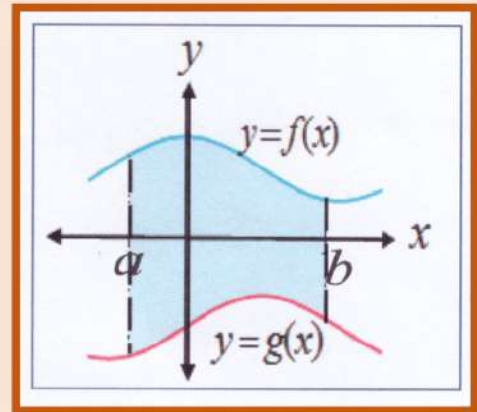
A) $\frac{40}{3}$

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

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

D) $\frac{14}{3}$

7. What is the area of the shaded region



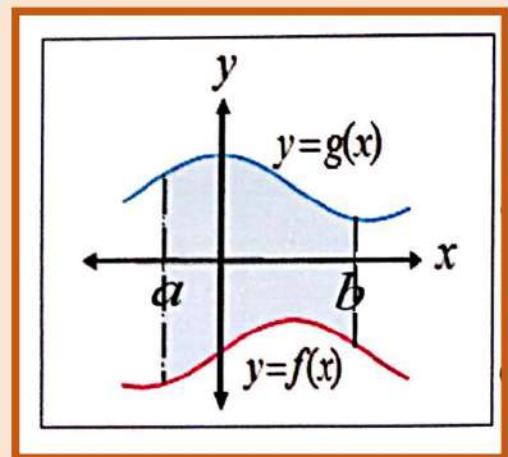
A) $\int_a^b [f(x) - g(x)] dx$

B) $\int_a^b f(x) dx$

C) $\int_a^b [g(x) - f(x)] dx$

D) $\int_a^b g(x) dx$

8. What is the area of the shaded region



A) $\int_a^b [f(x) - g(x)] dx$

B) $\int_a^b f(x) dx$

C) $\int_a^b [g(x) - f(x)] dx$

D) $\int_a^b g(x) dx$

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9. Find the area bounded by the graphs of $y = x$, $y = 6 - x$ and $y = 0$. Choose the variable of integration to write the area as a single integral.

A) $A = \int_0^2 (6 - y) dy$

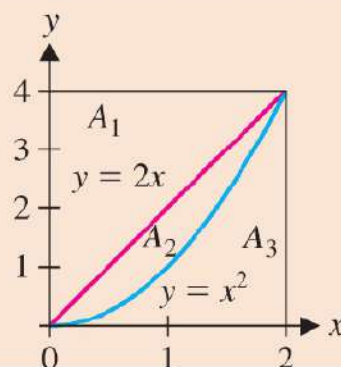
B) $A = \int_0^2 (6 - 2y) dy$

C) $A = \int_0^6 (6 + 2x) dx$

D) $A = \int_{-0}^6 (6 - 2x) dx$

10. In terms of A_1 , A_2 and A_3 ,

identify the area given by integral $\int_0^2 (4 - x^2) dx$



A) A_1

B) A_2

C) $A_1 + A_2$

D) A_3

11. Find the area of the region bounded by $y^2 = x$, and $x = 9$

A) $A = \int_{-3}^3 (y^2 - 9) dy$

B) $A = \int_{-3}^3 (9 - y^2) dy$

C) $A = \int_0^9 (\sqrt{x} - 9) dx$

D) $A = \int_0^9 (\sqrt{x} + 9) dx$

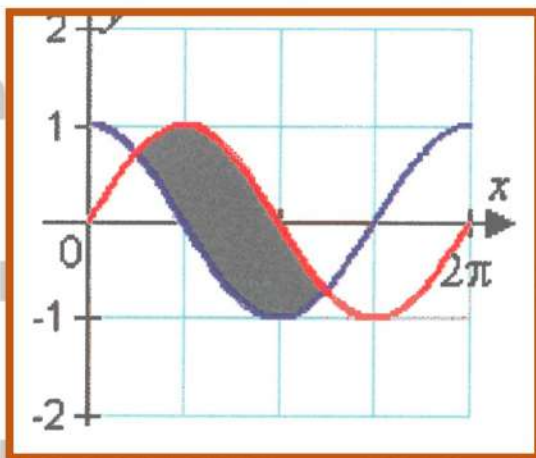
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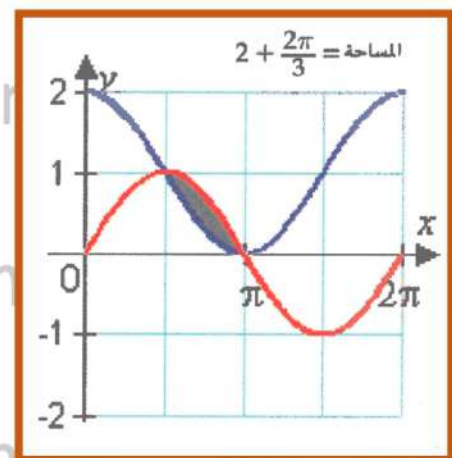
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12. Identify the graph and the area bounded by the curves only $y = 1 + \cos x$ and $y = \sin x$ on interval $\frac{\pi}{2} \leq x \leq \pi$

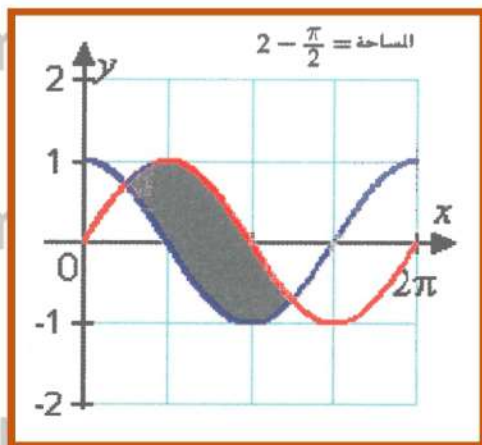
A) $A = 2 + \frac{\pi}{2}$



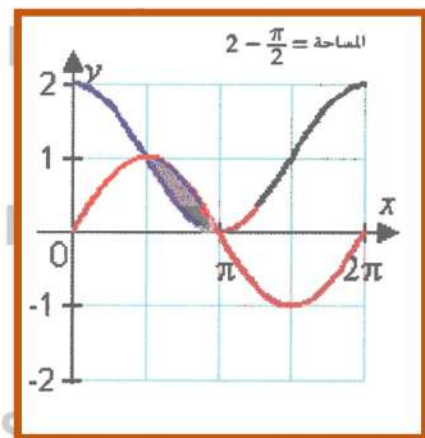
B) $A = 2 + \frac{2\pi}{3}$



C) $A = 2 - \frac{\pi}{2}$



D) $A = 2 - \frac{\pi}{2}$



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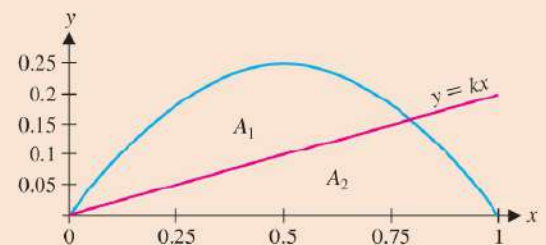
13. Find the area of the region bounded by $y^2 = x$, and $x = 36$

A) $A = \int_{-6}^6 (y^2 - 36) dy$

A) $A = \int_0^{36} (36 - \sqrt{x}) dx$

C) $A = \int_{-6}^6 (36 - y^2) dy$

C) $A = \int_0^{36} (\sqrt{x} - 36) dx$

14. For $y = x - x^2$ and $y = kx$ as shownFind A_1 such that $A_1 = A_2$ 

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

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

C) $\frac{1}{8}$

D) $\frac{1}{10}$

15. Find k such that the area between $y = x^2$ and $y = kx$ equals $\frac{4}{3}$.

A) 1

B) 2

C) 3

D) 4

16. Find the area of the region bounded by $y^2 = x$, and $x = y$

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

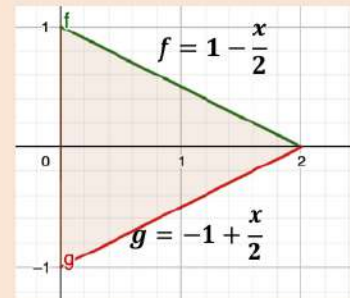
B) $\frac{1}{3}$

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

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

17. Evaluate

$$\int_0^2 [f(x) - g(x)] dx$$

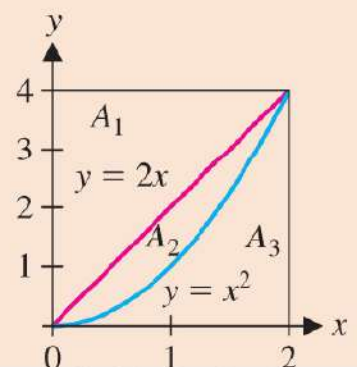


A) 2

B) 4

C) 0

D) 6

18. Find the area of the region bounded by $y = 4 - x^2$, and $y = x^2 - 4$ A) $\frac{64}{3}$ B) $\frac{32}{3}$ C) $\frac{16}{3}$ D) $\frac{8}{3}$ 19. In terms of A_1 , A_2 and A_3 ,identify the area given by integral $\int_0^4 (2 - \sqrt{y}) dy$ A) A_1 B) A_2 C) A_3 D) A_3

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20. Find the area of the region bounded by $y = 2 - x^2$, and $y = x^2$
on interval $[0, 2]$

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

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

C) 6

D) 4

21. Find the area of the region bounded by $y = e^{\frac{1}{2}x}$, and $y = 0$
on interval $[0, 2]$

A) $2e - 2$

B) $2e - 1$

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

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

22. Which integral gives the area of the region bounded by
 $y = 4 - x^2$, and $y = x - 2$

A) $\int_{-3}^2 (x^2 + x - 6) dx$

B) $\int_{-3}^2 (-x^2 - x + 6) dx$

C) $\int_{-3}^2 (-x^2 - x - 2) dx$

D) $\int_{-3}^2 (x^2 + x - 2) dx$

23. Set up the definite integral that gives the area of the region bounded by the curves $y = x^2$ and $y = \sqrt{x}$

A) $\int_0^1 (x^2 - \sqrt{x}) dx$

B) $\int_0^1 (\sqrt{x} - x^2) dx$

C) $\pi \int_0^1 (x^4 - x) dx$

D) $2\pi \int_0^1 (\sqrt{x} - x^2) dx$

24. Set up the definite integral that gives the area of the region bounded by the curves $y = \frac{x}{2}$ and $y = \sqrt{x}$

A) $\int_0^2 \left(y^2 - \frac{y}{2}\right) dy$

B) $\int_0^2 (y^2 - 2y) dy$

C) $\int_0^2 (2y - y^2) dy$

D) $\int_0^4 (2y - y^2) dy$

25. Find the area of the region bounded by

$$x = 4 - y^2, \text{ and } x = y - 2$$

A) $\frac{125}{12}$

B) $\frac{125}{2}$

C) $\frac{125}{3}$

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

26. Find the area of the region bounded by $y = \cos x$, and $y = \sin x$ on interval $[0, \pi]$

A) $\int_0^\pi (\cos x - \sin x) dx$

B) $\int_0^\pi (\sin x - \cos x) dx$

C) $\int_0^{\frac{\pi}{4}} (\cos x - \sin x) dx + \int_{\frac{\pi}{4}}^\pi (\sin x - \cos x) dx$

D) $\int_0^{\frac{3\pi}{4}} (\cos x - \sin x) dx + \int_{\frac{3\pi}{4}}^\pi (\sin x - \cos x) dx$

27. Set up the definite integral that gives the area of the region bounded by the curves $y = (x - 1)^3$ and $y = x - 1$

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

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

C) 1

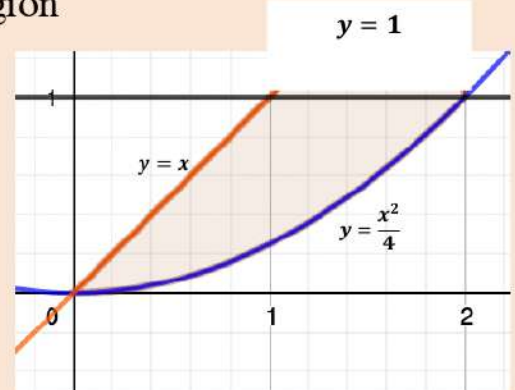
D) 0

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28. Which integral gives the area of the shaded region



A) $\int_0^1 (2\sqrt{y} - y) dy$

B) $\int_0^2 (2\sqrt{y} - y) dy$

C) $\int_0^2 (-y^2 + x + 2) dy$

D) $\int_0^2 (1 - \frac{y^2}{4}) dy$

ANSWER KEY

1	D	9	B	17	A	25	D
2	B	10	C	18	A	26	C
3	B	11	B	19	C	27	A
4	D	12	D	20	D	28	A
5	B	13	C	21	D		
6	C	14	A	22	B		
7	A	15	B	23	B		
8	C	16	C	24	B		