1. Find the area enclosed by the parabola $y = x^2 - 3$ and the line $y = 1$.

a) $\frac{8}{3}$ b) 32 c) $\frac{32}{3}$ d) $\frac{16}{3}$ e) none of these

2. Find the area enclosed by the parabola $y^2 = x$ and the line $x + y = 2$.

a) $\frac{5}{2}$ b) $\frac{3}{2}$ c) $\frac{11}{6}$ d) $\frac{9}{2}$ e) $\frac{29}{6}$

3. Find the area enclosed by the curve of $y = \frac{2}{x}$ and $x + y = 3$.

a) $\frac{1}{2} - 2\ln(2)$ b) $\frac{3}{2}$ c) $\frac{1}{2} - \ln(4)$ d) $\frac{5}{2}$ e) $\frac{3}{2} - \ln(4)$

4. Find the total area bounded by the cubic $x = y^3 - y$ and the line $x = 3y$:

a) 4 b) $\frac{16}{3}$ c) 8 d) $\frac{32}{3}$ e) 16

5. Suppose the following is a table of values for y = f(x), given that f is continuous on [1,5]:

x	1	2	3	4	5
y	1.62	4.15	7.50	9.00	12.13

If a trapezoidal sum is used, with n = 4, then the area under the curve from x = 1 to x = 5 is equal, to two decimal places, to…..

a) 6.88 b) 13.76 c) 20.30 d) 25.73 e) 27.53

6. Find the volume of the solid formed when the first quadrant region bounded by $y = x^2$, the y-axis, and $y = 4$, are revolved about the y-axis.

a) 8π b) 4π c) $\frac{64\pi}{3}$ d) $\frac{32\pi}{3}$ e) $\frac{16\pi}{3}$

7. Find the volume of the solid formed when the region enclosed by the curves $y = x^2$ and $y = 4$ is revolved about the line $y = 4$.

a) $\frac{256\pi}{15}$ b) $\frac{256\pi}{5}$ c) $\frac{512\pi}{5}$ d) $\frac{512\pi}{15}$ e) $\frac{64\pi}{3}$

8. The integral set-up for the volume formed when the region enclosed by the curves $y = x^2$ and $y = 4$ is revolved about the line $y = -1$ would be:

a) $4\pi\int_{-1}^{4}(y+1)\sqrt{y}\,dy$ b) $2\pi\int_{0}^{2}(4-x^2)^2\,dx$ c) $\pi\int_{-2}^{2}(16-x^4)dx$ d) $2\pi\int_{0}^{2}(24-2x^2-x^4)dx$

e) none of these

9. The integral set-up for the volume enclosed by the curves $y = 3x - x^2$ and $y = x$ about the *x*-axis would be:

a) $\pi\int_{0}^{3/2}\left[(3x-x^2)^2-x^2\right]dx$ b) $\pi\int_{0}^{2}\left(9x^2-6x^3\right)dx$ c) $\pi\int_{0}^{2}\left[(3x-x^2)^2-x^2\right]dx$

d) $\pi\int_{0}^{3}\left[(3x-x^2)^2-x^4\right]dx$ e) $\pi\int_{0}^{3}\left(2x-x^2\right)^2dx$

10. The integral set-up for the volume enclosed by the curves y = ln(x) , $y = 0$, and $x = e$ about the line $x = e$ would be:

a) $\pi\int_{1}^{e}(e-x)\ln(x)dx$ b) $\pi\int_{0}^{1}\left(e-e^y\right)^2dy$ c) $2\pi\int_{1}^{e}(e-\ln(x))dx$

d) $\pi\int_{0}^{e}\left(e^2-2e^{y+1}+e^{2y}\right)dy$ e) none of these

11. The base of a solid is a circle of radius *a*, and every plane section perpendicular to a diameter is a square. The solid has volume

a) $\frac{8}{3}a^3$ b) $2\pi a^3$ c) $4\pi a^3$ d) $\frac{16}{3}a^3$ e) $\frac{8\pi}{3}a^3$

12. If the curves of *f(x)* and *g(x)* intersect for *x = a* and *x = b* and if *f(x) > g(x) > 0* for all *x* on *(a,b)*, then the volume obtained when the region bounded by the curves is rotated about the *x*-axis is equal to

a) $\pi\int_{a}^{b}f^2(x)dx-\int_{a}^{b}g^2(x)dx$ b) $\pi\int_{a}^{b}[f(x)-g(x)]^2dx$ c) $2\pi\int_{a}^{b}x[f(x)-g(x)]dx$

d) $\pi\int_{a}^{b}[f^2(x)-g^2(x)]dx$ e) none of these

13. Find the area enclosed by the curve of $y = \dfrac{4}{x^2 + 4}$, the x-axis , and the vertical lines $x = -2$ and $x = 2$.

a) $\dfrac{\pi}{4}$ b) $\dfrac{\pi}{2}$ c) 2π d) π e) none of these

14. Find the area enclosed by the curve $y = x^3 - 2x^2 - 3x$ and the x-axis.

a) $\dfrac{28}{3}$ b) $\dfrac{79}{6}$ c) $\dfrac{45}{4}$ d) $\dfrac{71}{6}$ e) none of these

15. The area bounded by the parabola $y = 2 - x^2$ and the line $y = x - 4$ is given by

a) $\int_{-2}^{3} (6 - x - x^2)\,dx$ b) $\int_{-2}^{1} (2 + x + x^2)\,dx$ c) $\int_{-3}^{2} (6 - x - x^2)\,dx$

d) $2\int_{0}^{\sqrt{2}} (2 - x^2)\,dx + \int_{-3}^{2} (4 - x)\,dx$ e) none of these

16. The volume of the solid formed when the region bounded by the curve $y = x^2$ and the line $y = 4$ is revolved around the x-axis would be:

a) $\dfrac{64\pi}{5}$ b) $\dfrac{512\pi}{15}$ c) $\dfrac{256\pi}{5}$ d) $\dfrac{128\pi}{5}$ e) none of these

17. The volume of the solid formed when the region bounded by the curve $y = 3x - x^2$ and the line $y = 0$ is revolved around the x-axis would be:

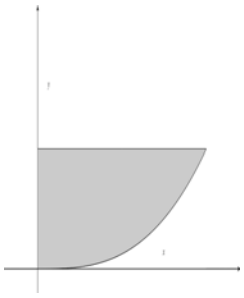
a) $\pi\int_0^3 \left(9x^2 + x^4\right)dx$ b) $\pi\int_0^3 \left(3x - x^2\right)^2 dx$ c) $\pi\int_0^{\sqrt{3}} \left(3x - x^2\right)dx$

d) $2\pi\int_0^3 y\sqrt{9-4y}\,dy$ e) $\pi\int_0^{9/4} y^2 dy$

18. The base of a solid is the region bounded by the parabola $x^2 = 8y$ and the line $y = 4$, and each plane section perpendicular to the y-axis is an equilateral triangle. The volume of the solid is

a) $\frac{64\sqrt{3}}{3}$ b) $64\sqrt{3}$ c) $32\sqrt{3}$ d) 32 e) none of these

19. The figure below shows part of the curve of and a rectangle with two vertices at (0,0) and (c,0). What is the ratio of the area of the rectangle to the shaded part of it above the cubic?



a) 3:4 b) 5:4 c) 4:3 d) 3:1 e) 2:1