

I.

1. Consider the integral $\int_1^5 x^2 + 1 dx$ Evaluate the integral by dividing the interval into 4 equal subintervals and approximate the integral by a sum.
2. For $f(x) = \cos(x)$ on $[0, \frac{\pi}{2}]$,
dividing the interval into 4 equal subintervals and approximate the integral by a sum.
3. Given that $f'(x) = 3x - 4$ and that $f(0) = 3$. Find $f(x)$.
4. Find the solution of $y' = 2x + 3$ satisfying $y = 2$ when $x = 0$

II. Integrate each of the following:

5. $\int_1^2 \frac{2 dx}{(x)^5}$ is:
6. $\int (4x^2 - 2)^4 8x dx$ is:
7. $\int \frac{x^3+6}{x^2} dx$.
Hint: divide out.
8. $\int_1^6 \sqrt{x} dx$
9. $\int \frac{dx}{(x+4)^2}$
10. $\int_1^3 x\sqrt{x^2 - 1} dx$
11. $\int_0^{\frac{1}{4}} \cos(\pi x) dx$
12. $\int \sin^2(x) \cos(x) dx$
13. $\int \frac{x^3+7x^2+5}{x^2} dx$
14. $\int_0^1 \frac{3x}{\sqrt{(6x^2+1)}} dx$
15. $D_x \int_0^x \sqrt{t^2 + 1} dt$
16. $D_x \int_0^{\sin(x)} \sqrt{t^3 + 1} dt$

III.

17. Find the area bounded by the y -axis, and $y = x^2 - 1$ and x -axis.
18. The area of the region bounded by the graphs of $y = \sqrt{x}$, $x = 0$, and $y = 2$.
19. Find the area bounded by the curves $y = 4x$ and $y = x^2 - 1$ and the y -axis.
20. A ball is thrown vertically into the air from a height of 160 feet above the ground and with an initial velocity of 48 ft/sec. Find the details of this flight. e.g. max ht, speed upon impact.

WE MAY NOT GET THIS FAR

21. The volume of the solid generated by revolving about the x -axis the region bounded by the graphs of $y = x$, $y = 0$, and $x = 2$ is described by
22. Find the volume of the solid generated by revolving about the y -axis the region bounded by the graphs of $y = x^2$ and $y = 2x$.