



I. Evaluate the following integrals.

(4 points each)

1. $\int \sqrt{w}(\sqrt{w} + 5w) dw$

4. $\int_{-1}^3 (x - |x - 2|) dx$

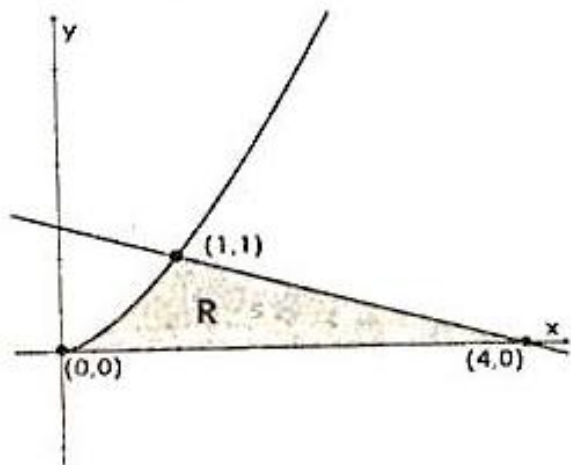
2. $\int \frac{\cos^2(5\theta) + 1}{\sin^2(5\theta)} d\theta$

5. $\int_{\frac{\pi}{2}}^{\frac{\pi}{3}} \frac{\sin \theta - \csc \theta}{\tan \theta} d\theta$

3. $\int u^2 \sqrt{u^{3/2} + 2} du$

II. Let R be the region bounded by the graphs of $y = x^{3/2}$, $x + 3y - 4 = 0$, and the x -axis as shown below.

(3 points each)



1. **Set up** a single definite integral equal to the area of the region R .
2. **Set up** the definite integral equal to the volume of the Solid of Revolution formed when the region R is revolved about the line $y = -1$ using:
 - a. the method of **cylindrical shells**.
 - b. the method of **washers**.
3. Find the length of the arc of the graph of $y = x^{3/2}$ from $x = 0$ to $x = 1$.

III. Do as indicated.

1. Given $F(x) = \int_{-3x}^2 \sqrt{1+t^2} dt$,

- a. Evaluate $F(-2/3)$. (1 point) b. Find $F'(x)$. (3 points)

2. A particle is moving along a straight line with an acceleration of $a(t) = 6t - 5$. Initially, the particle is 3 units to the left of the origin and after 2 seconds, the particle is 2 units to the right of the origin. Find the position function $s(t)$ of the particle. (4 points)