Calc #2 - Test #2

SPRING 1987

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Instructions. The ANSWER Section follows this section. The SOLUTION Section follows the ANSWER Section.

1. Compute: $\lim_{\triangle x \to 0} \Sigma_{i=1}^{n} \left(4x_i^2 - 3x_i + 2\right) \triangle x \qquad a = 1,\ b = 2$

2. Use the Area formula (i.e. the $f - g$ formula) to compute the area bounded by $y = x^2$ and $y = 8x - 12$

   In Problems 3-5 do not use a formula. Instead, draw a typical rectangle, partition the appropriate interval, build the Riemann Sum, take the limit, and compute the Integral.

3. Find the area bounded by $y = x^2 - 1$ and $y = x + 1$

4. Use the**Disc** Method to find the volume of the Solid of Revolution generated by revolving the region bounded by $y = x^{\frac{1}{2}},\ y = x^2$ about the axis $y = -1$

5. Use the **Shell** Method to find the volume of the Solid of Revolution generated by revolving the region in the first quadrant bounded by $x = 4y^2 - 2$, $x = y^2 + 1$ and the x-axis, about the x-axis.

6. Compute: $\int_0^1 \sqrt{5x + 4} dx$

7. Use geometry to compute: $\int_{-1}^1 \sqrt{1 - x^2} dx$

8. Suppose that $\int_0^1 \left(f\left(x\right) - g\left(x\right)\right) dx = 3$ and $\int_0^1 g\left(x\right) dx = 1$.
   Compute: $\int_0^1 3f\left(x\right) dx$

9. Suppose that $\int_0^1 \left(f\left(x\right) + 2g\left(x\right)\right) dx = 8$ and $\int_0^1 \left(2f\left(x\right) - g\left(x\right)\right) dx = -2$.
   Compute: $\int_0^1 f\left(x\right) dx$

10. Suppose that $\int_0^4 g\left(x\right) dx = -3$ and $\int_4^2 3g\left(x\right) dx = -2$.
    Compute: $\int_0^2 2g\left(x\right) dx$