1. Find the sum.

$$\sum_{i=1}^{4}\left[(i-2)^3 + (i+1)^2\right]$$

2. Use the properties and formulas for summation to evaluate the sum.

$$\sum_{i=1}^{20} i^2(2i+1)$$

3. Use the limit process to find the area of the region between the graph of the function and the $x-axis$ over the indicated interval.

    $y = x^2 - 2x + 1$ in the interval $[2,3]$

4. Evaluate the integral:    $\displaystyle\int_{1}^{8}\sqrt{\dfrac{2}{x}}\,dx$

5. Find the indefinite integral:    $\displaystyle\int \dfrac{3x^2 + 5x - 4}{2\sqrt{x}}\,dx$

6. Find the value(s) of c guarateed by the Mean Value Theorem for Integrals for the function over the indicated interval:

    $f(x) = \cos x$        over        $\left[-\dfrac{\pi}{3}, \dfrac{\pi}{3}\right]$

7. Find the average value for the function given over the indicated interval:

    $f(x) = x^2 + x - 4$     over     $[2,4]$

8. Complete the table by doing all the 5 methods to approximate the Area:

|  | Interval | n | Left Sum | Right Sum | Midpt. Sum | Trap. Sum | Simpsons |
|---|---|---|---|---|---|---|---|
| $f(x) = x^3 + 1$ | [1, 3] | 4 |  |  |  |  |  |