AP Calculus AB 4-1, 4-2, 4-6 Quiz Review WS #2

Calculators permitted.

1. Find the sum:

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

2. Use Sigma notation to write the sum: $\frac{5-\sqrt{2}}{1}+\frac{5-\sqrt{4}}{4}+\frac{5-\sqrt{6}}{9}+\frac{5-\sqrt{8}}{16}$

3. Use 3 left rectangles to approximate the area of the region bounded by $f(x) = 1+ 2x^2$, the x-axis, x =3, and x = 7.

4. Use the table of values on the right to estimate the below:

x	2	5	6	8	12	13	14
f(x)	1	2	8	3	1	6	5

a. Use 2 middle rectangles with intervals indicated by the table to estimate the area between the curve and x-axis on [5, 13]

b. Use 3 left-handed rectangles with intervals indicated by the table to estimate area between the curve and x-axis on [2, 14]

c. Use 2 trapezoids with interval indicated by the table to estimate area between the curve and x-axis on [6, 14]

5. Given the region bounded by g (x) = 3 + $2x^2$, the x-axis, x = -2, and x = 1. Use the **limit definition** to find the exact area of the region.

Find the general antiderivative of $g(x)$. (Find $\int g(x)dx$)

6. $g(x) = 3\cos x - 5\sin x + \csc x \cot x - 3\sqrt{x}$

7. $g(x) = \frac{2}{3\left(\sqrt[5]{x}\right)} - 3x^2 - \frac{1}{3e^4}$

8. $g(x) = \frac{2x^3 - 5\sqrt{x} + 3\left(\sqrt[4]{x}\right)}{x}$

9. Find the **general** expression of $f(x)$ if $f''(x) = 3x^3 + 5x^2 - x + 5$

10. Find the **specific** expression of $f(x)$ if $f'(x) = 5x^2 + 9x - 4$, $f(0) = 7$

4.1, 4.2, 4.6 Formula Sheet:

Summation Formulas:

1) $\sum_{i=1}^{n} 1 = n$

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

3) $\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$

4) $\sum_{i=1}^{n} i^3 = \frac{n^2(n+1)^2}{4}$

5) $\sum_{i=1}^{n} c\boldsymbol{a_i} = c\sum_{i=1}^{n} \boldsymbol{a_i}$

Area using Limit Definition

$$\lim_{n\to\infty} \sum_{i=1}^{n} (width) * f(left\ endpoint + width * i)$$

width = $\frac{b-a}{n}$

Trapezoid Area:

$Area = \frac{1}{2} w(h_1 + h_2)$

Integral Formulas:

Power Rule:

$$\int u^n du = \frac{u^{n+1}}{n+1} + C$$

Trig Integrals:

$$\int sin\, u\, du = -cos\, u + C \qquad \int cos\, u\, du = sin\, u + C$$

$$\int sec^2 u\, du = tan\, u + C \qquad \int sec\, u\, tan\, u\, du = sec\, u + C$$

$$\int csc^2 u\, du = -cot\, u + C \qquad \int csc\, u\, cot\, u\, du = -csc\, u + C$$