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

Calculators permitted.

1. Find the sum:

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

2. Use Sigma notation to write the sum: $\frac{2}{\sqrt[3]{5-2}}+\frac{4}{\sqrt[3]{5-4}}+\frac{6}{\sqrt[3]{5-6}}+\frac{8}{\sqrt[3]{5-8}}$

3. Use 3 middle rectangles to approximate the area of the region bounded by $f(x) = x^2 + 3$, the x-axis, $x = 1$, and $x = 6$.

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

x	0	4	6	7	10
$f(x)$	5	3	2	3	5

a. Use 3 left-handed rectangles with intervals indicated by the table to estimate the area between the curve and x-axis on [0, 7]

b. Use 2 middle rectangles with intervals indicated by the table to estimate the area between the curve and x-axis on [0, 10]

c. Use 3 right-handed rectangles with intervals indicated by the table to estimate area between the curve and x-axis on [4, 10]

d. Use 3 trapezoids with interval indicated by the table to estimate area between the curve and x-axis on [0, 7]

5. Given the region bounded by g (x) = 6 – x^2 , the *x*-axis, *x* = -1, and *x* = 2. Use the limit definition to find the exact area of the region.

Find the most general antiderivative of *h*(*x*). (Find $\int h(x)dx$)

6. $h(x) = 5x^4 - \pi + \frac{1}{2\sqrt{x}} + \frac{1}{3x^3}$

7. h(x) = -2cosx + 5sinx – $5cscxcotx$

8. Find the most general expression of *f* (*x*) if *f* "(*x*) = $4x^3$ – $5x^2$ + 3x – 6 .

9. Find the specific expression of *f* (*x*) if $f(x) = \int g(x)dx$, $g(x) = 3x^2 - 4x$, and *f* (-1) = 2

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

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

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

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:

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

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

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