

Calc. AB Classwork 4.1 – 4.4 (after break)

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Pd: \_\_\_\_\_

For #'s 1 – 6, find the given definite or indefinite integral.

1.  $\int \sqrt[5]{x^3} dx =$

2.  $\int (-5t^{-3} - \sin t) dt =$

3.  $\int \left( \frac{7}{2x^2} + \csc^2 x \right) dx =$

4.  $\int \frac{3x^5 + 5x^2 - x}{2\sqrt{x^3}} dx =$

5.  $\int_{-1}^3 (x^2 - 2)^2 dx =$

6.  $\int_1^9 \sqrt{x} + \frac{1}{2\sqrt{x}} dx =$

7.  $\frac{d}{dx} \int_0^x (\cos t + t^3) dt =$

8. Find  $F'(x)$  given  $\int_0^{3x^2} \frac{1}{t^2} dt$

9. Find the average value of  $f(x) = x^3 + 1$  over the interval  $[0, 3]$ .

10. Given  $f(x) = \frac{9}{x^3}$  on the interval  $[1, 3]$ , find the value of  $c$  guaranteed by the MVT for integrals.

11. Solve the differential equation given  $f''(x) = x^3$ ,  $f'(1) = 6$ ,  $f(0) = 3$ .

12. The table provides the values of  $f(x)$ :

$x$	1	4	7	10	13
$f(x)$	5	11	20	28	18

a) Find the Left Riemann sum for the given intervals.

b) Find the Right Riemann sum for the given intervals.

c) Find the Trapezoidal Riemann sum for the given intervals.

d) Find the Midpoint sum with two equal subintervals.

13. The graph of a function  $f$  consists of a quarter circle and line segments. Let  $g$  be the function

given by  $g(x) = \int_0^x f(t) dt$ .

a) Find  $g(-1)$ ,  $g(2)$ , and  $g(5)$

b) Find  $g'(3)$

c) Find all values of  $x$  on the open interval  $(-1, 5)$  at which  $g$  has a relative maximum. Explain your answer.

