

AP Calculus CH 5 Test 1 Review 2 (Revised with Online Video)

1. Find the derivative of each of the following:

(a) $y = \int_a^x (t^3 + 1) dt$ (b) $y = \int_x^5 3t \sin t dt$ (c) $y = \int_1^{x^2} \cos t dt$

2. Suppose $F(x) = \int_1^x f(t) dt$ and $f(t) = \int_1^{t^2} (1 + u^3) du$. Find $F'(4)$.

Integrate each without a calculator:

3. $\int_0^2 x(x - 3) dx$

4. $\int_{-1}^1 (x^2 - 2x + 3) dx$

5. $\int_0^4 \left(3x - \frac{x^3}{4}\right) dx$

6. $\int_{-2}^2 (x^3 - 2x + 3) dx$

7. $\int_0^1 (x^2 + \sqrt{x}) dx$

8. $\int_0^{32} x^{-6/5} dx$

9. The accumulation of rainfall was monitored over a 10-hour period. The table shown records the data collected for the 10 hour period:

	a) left endpoints						b) right endpoints.				
Number of hours	0	1	2.5	3.5	4	5.8	6.2	7.5	8	9.5	10
Velocity (in/hr)	0	12	22	10	5	13	11	6	2	6	0

c) Using the left endpoint approximation, estimate the average rainfall over in the 10 hour period.

10. Find $\int_1^5 (x^2 + 3x) dx$ using:

a) Left Endpoints

b) Right Endpoints

c) Midpoints

d) Trapezoids

e) Find the exact value

9. The accumulation of rainfall was monitored over a 10-hour period. The table shown records the data collected for the 10 hour period: a) left endpoints b) right endpoints.

Number of hours	0	1	2.5	3.5	4	5.8	6.2	7.5	8	9.5	10
Velocity (in/hr)	0	12	22	10	5	13	11	6	2	6	0

c) Using the left endpoint approximation, estimate the average rainfall over in the 10 hour period.

Answers:

1. a) $x^3 + 1$ b) $-3x \sin x$ c) $2x \cos x^2$
 2. 32776
 3. $-10/3$ 4. $20/3$ 5. 8 6. 12 7. 1 8. No solution
 9. a) 82.5 in b) 103.1 in c) 8.25 in/hr
 10. a) $60 u^2$ b) $96 u^2$ c) $77 u^2$ d) $78 u^2$ e) $232/3 u^2$ or $77 \frac{1}{3} u^2$