

**AP CALCULUS (AB)**  
**Unit 5**  
**Test – Sample**

Name \_\_\_\_\_  
Date \_\_\_\_\_  
Period \_\_\_\_\_

No calculators may be used on this portion of the test.

Suppose  $g(x) = \int_{-1}^x f(t) dt$  and  $h(x) = \int_0^{x^2} f(t) dt$ . Use the graph of  $f$  shown to evaluate the following.

1.  $g(-2)$

2.  $g(-1)$

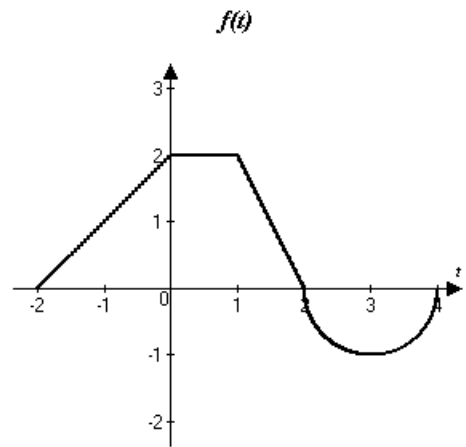
3.  $g(4)$

4.  $g'(1)$

5.  $g''(0.5)$

6.  $h(-1)$

7.  $h'(\sqrt{3})$



Evaluate.

8.  $\int \sec^2(2-x) dx$

9.  $\int e^x (1+e^x)^{10} dx$

10.  $\int \alpha \tan \alpha^2 d\alpha$

11.  $\int \frac{z}{3+z} dz$

Evaluate.

12.  $\int_1^2 (u - 2^u) du$

13.  $\int_0^3 |x^2 - 4| dx$

14.  $\int_0^{1/2} \frac{1}{1+4y^2} dy$

15.  $\int_0^1 \frac{x dx}{\sqrt{1-x^2}}$

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**Test – Sample**

Name \_\_\_\_\_  
Date \_\_\_\_\_  
Period \_\_\_\_\_

Calculators may be used on this portion of the test.

A group of teachers attends a diet support group every week. A teacher monitors her rate of weight loss,  $W(t)$ , in pounds per week. Use the data from the table to answer the following.

$t$	$W(t)$
0	4.0
2	3.1
5	2.8
6	2.3
7	1.7
9	1.4
10	1.9

16. Using units, describe what  $\int_0^{10} W(t) dt$  represents.

17. Use trapezoids with three subdivisions to approximate  $\int_0^{10} W(t) dt$ .

18. When the teacher first joined the diet support group, her weight was 184 pounds. Estimate her weight at week 10 using three rectangles with right endpoints as sample points. (Hint:  $W(t)$  is the rate of weight loss.)

Suppose a particle travels along a linear path at a velocity of  $v(t) = \frac{1}{\sqrt{t}} - \frac{3}{2}$ , in meters per second,  $t \geq 1$  second.

19. Calculate  $\int_1^4 |v(t)| dt$ .

20. Explain what  $\int_1^4 |v(t)| dt$  represents. Include units in your explanation.

21. Calculate the displacement of the particle over the interval  $[1, 6]$ .