Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Use a finite approximation to estimate the area of the region enclosed between the graph of f and the x-axis for $a \le x \le b$.

1) $f(x) = x^2$, $a = 2$, $b = 6$ 1) _____
Use LRAM with four rectangles of equal width.
A) 62 B) 69 C) 86 D) 54

2) $f(x) = 9 - x^2$, $a = -3$, $b = 3$ 2) _____
Use MRAM with two rectangles of equal width.
A) 40.5 B) 20.25 C) 6 D) 13.5

Estimate the value of the quantity.

3) Joe wants to find out how far it is across the lake. His boat has a speedometer but no odometer. The table shows the boats velocity at 10 second intervals. Estimate the distance across the lake using right-end point values. 3) _____

Time (sec)	Velocity (ft/sec)
0	0
10	12
20	30
30	55
40	52
50	57
60	54
70	57
80	47
90	15
100	0

A) 3890 ft B) 5700 ft C) 3790 ft D) 379 ft

Graph the integrand and use areas to evaluate the integral.

4) $\int_{-3}^{7} 4\,dx$ 4) _____
A) 10 B) 16 C) 20 D) 40

5) $\int_{-4}^{2} (-2x + 4)\,dx$ 5) _____
A) 48 B) 72 C) 12 D) 36

6) $\int_{-7}^{7} \sqrt{49 - x^2}\,dx$ 6) _____
A) 7π B) $\frac{49}{2}\pi$ C) 49 D) 49π

7) $\int_{-8}^{8} (8 - |x|)\,dx$ 7) _____

A) 192 B) 64 C) 128 D) 32

Use areas to evaluate the integral.

8) $\int_{a}^{b} 8x\,dx, \quad 0 < a < b$ 8) _____

A) $8(b^2 - a^2)$ B) $4(b - a)$ C) $8(b - a)$ D) $4(b^2 - a^2)$

Express the desired quantity as a definite integral and evaluate the integral.

9) A snail travels at 0.7 feet/min for 2 minutes. How far does it travel? 9) _____

A) $\int_{0}^{2} 0.7\,dt$; 1.4 ft B) $\int_{0}^{1} 2\,dt$; 2 ft

C) $\int_{0}^{1} 0.7\,dt$; 0.7 ft D) $\int_{0}^{2} 0.7\,dt$; $\frac{0.7}{2}$ ft

10) Find the distance of a train moving at 50 mph from 6:00 A.M. to 9:30 A.M. 10) _____

A) $\int_{0}^{3.5} 50\,dt$, 175 miles B) $\int_{6}^{9} 50\,dt$, 444 miles

C) $\int_{0}^{3} 50\,dt$, 150 miles D) $\int_{6}^{9} 50\,dt$, 150 miles

Use NINT on a calculator to find the numerical integral of the function over the specified interval.

11) $y = \frac{x}{36 + x^2}$; from $x = 0$ to $x = 5$ 11) _____

A) 1.498 B) 0.264 C) -0.264 D) 0.132

12) $\int_{0}^{2} x^2 e^{4x}\,dx$ 12) _____

A) 2328.87 B) 2980.93 C) 838.36 D) 2328.84

Solve the problem.

13) Suppose that $\int_{1}^{3} f(x)\,dx = 1$. Find $\int_{6}^{6} f(x)\,dx$ and $\int_{3}^{1} f(x)\,dx$. 13) _____

A) 6; 1 B) 0; -1 C) 1; -1 D) 0; 1

14) Suppose that h is continuous and that $\int_{-4}^{5} h(x)\,dx = 2$ and $\int_{5}^{8} h(x)\,dx = -10$. Find $\int_{-4}^{8} h(t)\,dt$ and $\int_{8}^{-4} h(t)\,dt$. 14) _____

A) −8; 8 B) −12; 12 C) 8; −8 D) 12; −12

USE NINT to find the average value of the function on the interval. At what point in the interval does the function assume its average value?

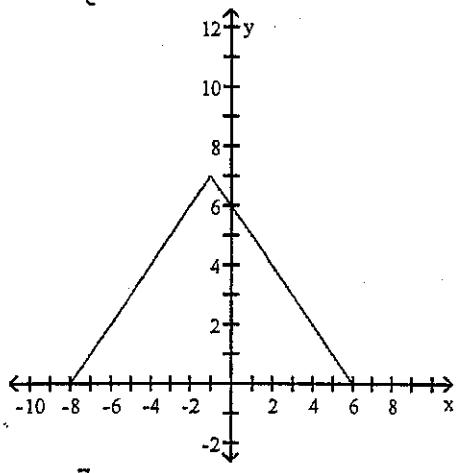
15) $y = -7x^2 - 1, [0, 3]$ 15) _____

A) 22, at $x = 1.73205081$ B) 64, at $x = 3$

C) −22, at $x = 1.73205081$ D) −64, at $x = 3$

Find the average value of the function without integrating, by appealing to the geometry region between the graph and the x-axis.

16) $f(x) = \begin{cases} x + 8, & -8 \le x \le -1 \\ -x + 6, & -1 < x \le 6 \end{cases}$ 16) _____



A) $\frac{7}{2}$ B) 2 C) 4 D) 7

Evaluate the definite integral.

17) $\int_{-2}^{9} e^x\,dx$ 17) _____

A) $e^9 + e^2$ B) $e^9 - e^2$ C) $e^9 - \frac{1}{e^2}$ D) e^{11}

18) $\int_{-\pi/2}^{\pi/2} (\cos x + 5)\,dx$ 18) _____

A) $2 + 5\pi$ B) 0 C) 7 D) 5π

19) $\int_{1}^{3} (2x^3 - 4x^{-2})\,dx$ 19) _____

A) 56 B) 48 C) 37.33 D) 45.83

20) $\int_1^e \frac{20}{x}\,dx$ 20) _____

A) 20 B) 0 C) -20 D) $-10e^2$

21) $\int_{-2}^{-1} 2x^{-4}\,dx$ 21) _____

A) $\frac{1}{12}$ B) 14 C) $\frac{7}{12}$ D) $\frac{7}{24}$

Find the average value over the given interval.

22) $y = 6x^5$; $[-3, 3]$ 22) _____

A) 1458 B) 243 C) 0 D) $\frac{243}{2}$

23) $y = 6x + 1$; $[1, 8]$ 23) _____

A) 55 B) 6 C) 28 D) 196

24) $y = 3 \sin x$; $[0, \pi]$ 24) _____

A) $\frac{3}{\pi}$ B) $\frac{2}{\pi}$ C) $\frac{18}{\pi}$ D) $\frac{6}{\pi}$

Find dy/dx.

25) $\int_1^{\sqrt{x}} 18t^9\,dt$ 25) _____

A) $9x^4$ B) $\frac{9}{5}x^6 - \frac{9}{5}$ C) $18x^{9/2}$ D) $12x^6$

26) $\int_0^{\sin t} \frac{1}{16 - x^2}\,dx$ 26) _____

A) $\frac{-\cos t}{16 - \sin^2 t}$ B) $\frac{1}{16 - \sin^2 t}$

C) $\frac{\cos t}{16 - \sin^2 t}$ D) $\frac{1}{\cos t\,(16 - \sin^2 t)}$

27) $\int_0^x \sqrt{4t + 7}\,dt$ 27) _____

A) $\sqrt{4x + 7}$ B) $\frac{1}{6}(4x + 7)^{3/2}$ C) $\frac{2}{\sqrt{4x + 7}}$ D) $\sqrt{4x + 7} - \sqrt{7}$

Evaluate the integral.

28) $\int_{1/5}^{3} \left(5 - \frac{1}{x}\right) dx$ 28) _____

A) $14 - \ln 15$
B) $14 - \ln 1.66666667$
C) $15 - \ln 15$
D) $14 - \ln 0.6$

29) $\int_{2}^{-1} 3^x \, dx$ 29) _____

A) $\frac{10}{3 \ln 3}$
B) $\frac{-28}{3 \ln 3}$
C) $\frac{-26}{3 \ln 3}$
D) $\frac{-8}{3 \ln 3}$

30) $\int_{1}^{4} x^{-1/2} \, dx$ 30) _____

A) 0
B) 2
C) 3
D) 1

31) $\int_{-\pi/2}^{\pi/2} (\cos x + 9) \, dx$ 31) _____

A) 0
B) 11
C) $2 + 9\pi$
D) 9π

32) $\int_{-1}^{1} (r + 1)^2 \, dr$ 32) _____

A) $\frac{4}{3}$
B) $\frac{8}{3}$
C) $\frac{1}{3}$
D) $\frac{2}{3}$

Find the total area of the region between the curve and the x-axis.

33) $y = 2x + 7; \ 1 \le x \le 5$ 33) _____

A) 52
B) 9
C) 18
D) 26

34) $y = -x^2 + 9; \ 0 \le x \le 5$ 34) _____

A) $\frac{10}{3}$
B) $\frac{10}{9}$
C) $\frac{5}{9}$
D) $\frac{98}{3}$

Use NINT to solve the problem.

35) Evaluate $\int_{0}^{10} \frac{1}{4 + 3 \cos x} \, dx$. 35) _____

A) ≈ 0.026
B) ≈ 0.022
C) ≈ 4.064
D) ≈ 3.107

36) Evaluate $\int_{1}^{3} \ln (t) \, dt$. 36) _____

A) 0.29584
B) None of the above is correct.
C) 1.29584
D) 2.29584

Solve the problem.

37) Suppose that $\int_1^x f(t)\,dt = 4x^2 + 7x - 2$. Find f(x). 37) _____

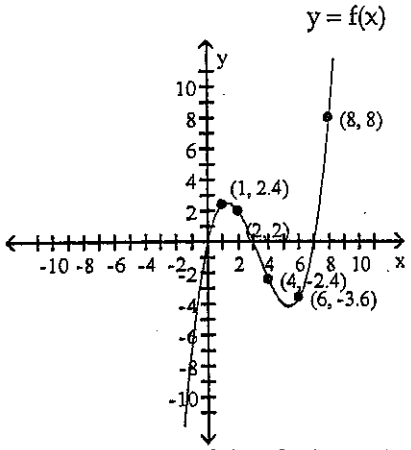
A) $\frac{4}{3}x^3 + \frac{7}{2}x^2 - 2x$

B) $8x + 7$

C) $\frac{4}{3}x^3 + \frac{4}{3}x^2 - 2x - 9$

D) $4x^2 + 7x - 2$

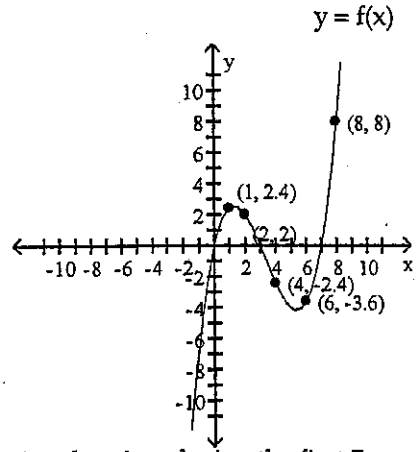
38) Suppose that f is the differentiable function shown in the graph and that the position at time t (in seconds) of a particle moving along a coordinate axis is $s = \int_0^t f(x)\,dx$ feet. 38) _____



What is the particle's velocity at time t = 8?

A) 11 ft/sec B) 8 ft/sec C) 0 ft/sec D) −8 ft/sec

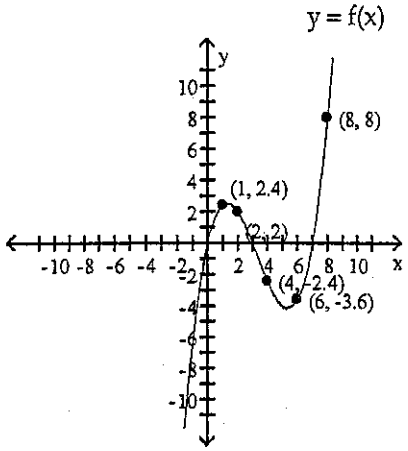
39) Suppose that f is the differentiable function shown in the graph and that the position at time t (in seconds) of a particle moving along a coordinate axis is $s = \int_0^t f(x)\,dx$ feet. 39) _____



At what time during the first 7 sec does s have its largest value?

A) 7 sec B) 1 sec C) 3 sec D) 5 sec

40) Suppose that f is the differentiable function shown in the graph and that the position at time t (in seconds) of a particle moving along a coordinate axis is $s = \int_0^t f(x)\,dx$ feet. 40) _____



At what time during the first 7 sec does s have its smallest value?

A) 5 sec B) 6 sec C) 7 sec D) 3 sec

Use the Trapezoidal Rule to estimate the integral.

41) $\int_0^2 4x^2\,dx$, n = 4 41) _____

A) 22 B) 15 C) $\frac{32}{3}$ D) 11

42) $\int_1^4 f(x)\,dx$ 42) _____

x	1	2	3	4
f(x)	4.4	6.8	9.5	13.5

A) 34.75 B) 25.25 C) 32.05 D) 27.75

Solve the problem.

43) Suppose that g is continuous and that $\int_4^6 g(x)\,dx = 8$ and $\int_4^8 g(x)\,dx = 14$. Find $\int_8^6 g(x)\,dx$. 43) _____

A) 6 B) 22 C) -6 D) -22

44) Suppose that $\int_3^4 f(x)\,dx = 7$. Find $\int_3^4 5f(u)\,du$ and $\int_3^4 -f(u)\,du$. 44) _____

A) 12; 7 B) 35; $\frac{1}{7}$ C) 5; -7 D) 35; -7

45) Suppose that $\int_{-4}^{-1} g(t)\,dt = 6$. Find $\int_{-4}^{-1} \frac{g(x)}{6}\,dx$ and $\int_{-1}^{-4} -g(t)\,dt$. 45) _____

A) 1; -6 B) 1; 6 C) 0; 6 D) -1; -6

46) Suppose that f and g are continuous and that $\int_3^7 f(x)\,dx = -2$ and $\int_3^7 g(x)\,dx = 8$. 46) _____

Find $\int_3^7 [4f(x) + g(x)]\,dx$.

A) 0 B) 30 C) 24 D) 12

Use the Trapezoidal Rule to estimate the integral.

47) $\int_2^{14} f(x)\,dx$ 47) _____

x	2	4	6	8	10	12	14
f(x)	2.31	1.61	1.35	1.32	1.25	1.16	1.12

A) 22.01 B) 24.99 C) 18.68 D) 16.81

Solve the problem.

48) Suppose that the accompanying table shows the velocity of a car every second for 8 seconds. Use the Trapezoidal Rule to approximate the distance traveled by the car in the 8 seconds. 48) _____

Time (sec)	Velocity (ft/sec)
0	19
1	20
2	21
3	23
4	22
5	24
6	21
7	19
8	20

A) 257.5 feet B) 189 feet C) 339 feet D) 169.5 feet

49) A data-recording thermometer recorded the soil temperature in a field every 2 hours from noon to midnight, as shown in the following table. Use the Trapezoidal Rule to estimate the average temperature for the 12-hour period. 49) _____

Time	Temp (°F)
Noon	66
2	67
4	69
6	69
8	68
10	68
Midnight	67

A) 67.92°F B) 67.94°F C) 81.50°F D) 79.00°F

Answer Key
Testname: PRACTICE TEST

1) D
2) A
3) C
4) D
5) D
6) B
7) B
8) D
9) A
10) A
11) B
12) D
13) B
14) A
15) C
16) A
17) C
18) A
19) C
20) A
21) C
22) C
23) C
24) D
25) A
26) C
27) A
28) A
29) B
30) B
31) C
32) B
33) A
34) A
35) C
36) C
37) B
38) B
39) C
40) C
41) D
42) B
43) C
44) D
45) B
46) A
47) D
48) D
49) A