Multiple-Choice:

1. The table shows the speed of an object, in feet per second, during a 3-second period. Estimate the distance the object travels, using the trapezoid method.

Time (sec)	0	1	2	3
Speed (ft/sec)	30	22	12	0

a. 34 ft
b. 45 ft
c. 48 ft
d. 49 ft
e. 64 ft

2. Estimate $\int_0^4 \sqrt{25-x^2}\,dx$ using the Left-Rectangular Rule and two subintervals.

a. $3+\sqrt{21}$
b. $5+\sqrt{21}$
c. $6+2\sqrt{21}$
d. $8+2\sqrt{21}$
e. $10+2\sqrt{21}$

3. For the function whose values are given in the table below, $\int_0^6 f(x)dx$ is approximated by a Riemann Sum using the value at the midpoint of each three intervals of width 2.

x	0	1	2	3	4	5	6
f(x)	0	0.25	0.48	0.68	0.84	0.95	1

The approximation is

a. 2.64
b. 3.64
c. 3.72
d. 3.76
e. 4.64

4. Let f be differentiable for all real numbers. Which of the following must be true for any real numbers a and b?

I. $\int_2^a f(x)dx = \int_2^b f(x)dx + \int_b^a f(x)dx$

II. $\int_a^b ([f(x)]^2 + f'(x))dx = [f(b)]^2 - [f(a)]^2$

III. $\int_a^b 3f(x)dx = 3\int_a^b f(x)dx$

a. I only
b. II only
c. I and II
d. I and III
e. I, II, and III

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5. The velocity of a particle moving along a straight line is given by $v(t) = 3x^2 - 4x$. Find an expression for the acceleration of the particle.

a. $x^3 - 4$
b. $x^3 - 2x^2$
c. $3x^2 - 4$
d. $3x - 4$
e. $6x - 4$

6. Suppose f and g are even functions that are continuous for all x and let *a* be a real number. Which of the following expressions must have the same value?

I. $\int_{-a}^{a}[f(x)+g(x)]dx$ II. $2\int_{0}^{a}[f(x)+g(x)]dx$ III. $\int_{-a}^{a} f(x)dx + \int_{-a}^{a} g(x)dx$

a. I and II only
b. I and III only
c. II and III only
d. I, II, and III
e. None

7. A particle moves along a line with acceleration 2 + 6t at time t. When t = 0, its velocity, v, equals 3 and its position, s, is 2. When t = 1, it is at position s =

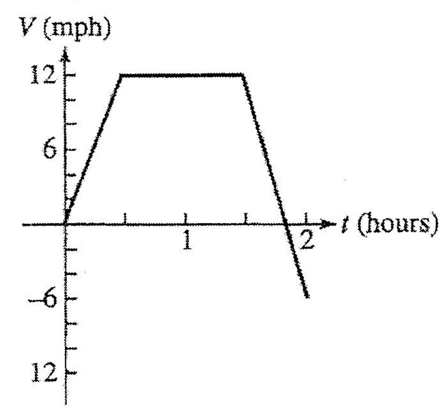
a. 2 b. 5 c. 6 d. 7 e. 8

8. The average value of cos x over the interval $\frac{\pi}{3} \le x \le \frac{\pi}{2}$ is

a. $\frac{3}{\pi}$
b. ½
c. $\frac{3(2-\sqrt{3})}{\pi}$
d. $\frac{3}{2\pi}$
e. $\frac{2}{3\pi}$

9. A bicyclist rides along a straight road starting from home at t = 0. The graph below shows the bicyclist's velocity as a function of t. How far from home is the bicyclist after 2 hours?

a. 13 miles
b. 16.5 miles
c. 17.5 miles
d. 18 miles
e. 20 miles



10. Let $A = \int_{0}^{1}(\cos x)dx$. We estimate A using the L, R, and T approximations with n = 100 subintervals. Which is true?

a. L < A< T< R
b. L < T < A < R
c. R < A < T < L
d. R < T < A< L
e. The order cannot be determined

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11. If f(x) is continuous on the interval $a \le x \le b$ and a < c < b, then $\int_c^b f(x)dx$ is equal to

a. $\int_a^c f(x)dx + \int_c^b f(x)dx$

b. $\int_a^c f(x)dx - \int_c^b f(x)dx$

c. $\int_c^a f(x)dx + \int_b^a f(x)dx$

d. $\int_a^b f(x)dx - \int_a^c f(x)dx$

e. $\int_a^c f(x)dx - \int_b^c f(x)dx$

12. If f(x) is continuous on $a \le x \le b$, then

a. $\int_a^b f(x)dx = f(b) - f(a)$

b. $\int_a^b f(x)dx = -\int_b^a f(x)dx$

c. $\int_a^b f(x)dx \ge 0$

d. $\frac{d}{dx}\int_a^x f(t)dt = f'(x)$

e. $\frac{d}{dx}\int_a^x f(t)dt = f(x) - f(a)$

13. If F'(x) = G'(x) for all x, then

a. $\int_a^b F'(x)dx = \int_a^b G'(x)dx$

b. $\int F(x)dx = \int G(x)dx$

c. $\int_a^b F(x)dx = \int_a^b G(x)dx$

d. $\int F(x)dx = \int G(x)dx + C$

e. F(x)= G(x) for all x

14. Using M(3), we find the approximate area of the shaded region below is

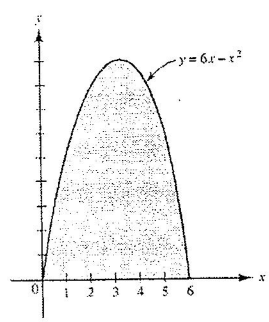
a. 9

b. 19

c. 36

d. 38

e. 54



15. Using T(6), we find the approximate area of the above shaded region is

a. 17.5

b. 30

c. 35

d. 36

e. 60

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16. $\int_{0}^{8} x^{2/3}\,dx$

a. 1/3
b. 96/5
c. 4/3
d. -1/3
e. -96/5

17. $\int_{\pi/2}^{x} 2\cos t\,dt =$

a. 2cosx
b. -2cosx
c. 2sinx
d. -2sinx + 2
e. 2sinx – 2

18. If f(x) is an anti-derivative of $x^2\sqrt{x^3-1}$ and f(2) = 0, then f(0) =

a. -6
b. 6
c. 2/9
d. -52/9
e. DNE

19. $g(x) = \int_{1}^{x} \frac{3t}{t^3+1}\,dt$, then g'(2) is

a. 0
b. -2/3
c. 2/3
d. -5/6
e. 5/6

20. The temperature of a cup of coffee is dropping at a rate of $f(t) = 4\sin\frac{t}{4}$ degrees for 0≤t≤5, where f is measured in Fahrenheit and t in minutes. If initially, the coffee is 95°F, find its temperature to the nearest degree Fahrenheit 5 minutes later.

a. 84
b. 85
c. 91
d. 92
e. 94