

Name: _____
AP Calculus AB

Date: _____
Ms. Loughran

1. If $g(x)$ is continuous for all values of x , then $\int_{\frac{a}{3}}^{\frac{b}{3}} g(3x) dx =$

(A) $\frac{1}{3} \int_a^b g(x) dx$

(B) $3 \int_a^b g(x) dx$

(C) $\frac{1}{3} \int_{3a}^{3b} g(x) dx$

(D) $\int_a^b g(x) dx$

(E) $3 \int_{3a}^{3b} g(x) dx$

2. If $\frac{dy}{dx} = 2y^2$ and $y = -1$ when $x = 1$ when $x = 2$, $y =$

(A) $-\frac{1}{2}$ (B) $-\frac{1}{3}$ (C) 0 (D) $\frac{1}{3}$ (E) $\frac{1}{2}$

3. If $\int_k^2 (2x - 2) dx = -3$ a possible value of k is

(A) -2 (B) 0 (C) 1 (D) 2 (E) 3

4. $\int_{-1}^1 \frac{4}{1+x^2} dx =$

(A) 0 (B) π (C) 1 (D) 2π (E) 2

5. The acceleration of a particle moving along the x -axis at time t is given by $a(t) = 4t - 12$. If the velocity is 10 when $t = 0$ and the position is 4 when $t = 0$, then the particle changes direction at

- (A) $t = 1$
(B) $t = 3$
(C) $t = 5$
(D) $t = 1$ and $t = 5$
(E) $t = 1, t = 3,$ and $t = 5$

6. If $\int_{30}^{100} f(x)dx = A$ and $\int_{50}^{100} f(x)dx = B$, then $\int_{30}^{50} f(x)dx =$

- (A) $A + B$ (B) $A - B$ (C) 0 (D) $B - A$ (E) 20

7. Which of the following integrals correctly gives the area of the region consisting of all points above the x -axis and below the curve $y = 8 + 2x - x^2$?

- (A) $\int_{-2}^4 (x^2 - 2x - 8)dx$ (C) $\int_{-2}^4 (8 + 2x - x^2)dx$ (E) $\int_2^4 (8 + 2x - x^2)dx$
(B) $\int_{-4}^2 (8 + 2x - x^2)dx$ (D) $\int_{-4}^2 (x^2 - 2x - 8)dx$

8. $\int_0^{\frac{\pi}{2}} \sin(2x)e^{\sin^2 x} dx =$

- (A) e (B) $e - 1$ (C) $1 - e$ (D) $e + 1$ (E) 1

Calculator Active

9. If the definite integral $\int_1^3 (x^2 + 1)dx$ is approximated by using the Trapezoid

Rule with $n = 4$, the error is

- (A) 0 (B) $\frac{7}{3}$ (C) $\frac{1}{12}$ (D) $\frac{65}{6}$ (E) $\frac{97}{3}$

10. Find the distance traveled in the first four seconds, for a particle whose velocity is given by $v(t) = 7e^{-t^2}$, where t stands for time.

- (A) 0.976 (B) 6.204 (C) 6.359 (D) 12.720 (E) 7.000