

# SAT PREP

## Assignment : AP CALCULUS BC TEST (Antidifferentiation)

1.  $\int \frac{x^2}{x^2 - 1} dx =$

(A)  $x + \frac{1}{2} \ln \left| \frac{x-1}{x+1} \right| + C$       (B)  $\ln |x^2 - 1| + C$       (C)  $x + \tan^{-1} x + C$

(D)  $x + \frac{1}{2} \ln \left| \frac{x+1}{x-1} \right| + C$       (E)  $1 + \frac{1}{2} \ln \left| \frac{x+1}{x-1} \right| + C$

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

(A) 2      (B) 5      (C) 6      (D) 7      (E) 8

3.  $\int \arctan x dx =$

(A)  $\arctan x + C$

(B)  $x \arctan x - \ln(1 + x^2) + C$

(C)  $x \arctan x + \ln(1 + x^2) + C$

(D)  $x \arctan x + \frac{1}{2} \ln(1 + x^2) + C$

(E)  $x \arctan x - \frac{1}{2} \ln(1 + x^2) + C$

4.  $\int \frac{x-1}{x(x-2)} dx =$

(A)  $\frac{1}{2} \ln|x| + \ln|x-2| + C$       (B)  $\frac{1}{2} \ln \left| \frac{x-2}{x} \right| + C$

(C)  $\ln|x-2| + \ln|x| + C$       (D)  $\frac{1}{2} \ln|x(x-2)| + C$

(E) none of these

5.  $\int \frac{dy}{y(1 + \ln y^2)} =$

(A)  $\frac{1}{2} \ln|1 + \ln y^2| + C$       (B)  $-\frac{1}{(1 + \ln y^2)^2} + C$

(C)  $\ln|y| + \frac{1}{2} \ln|\ln y| + C$       (D)  $\tan^{-1}(\ln|y|) + C$       (E) none of these

6. Find the acceleration (in ft/sec<sup>2</sup>) needed to bring a particle moving with a velocity of 75 ft/sec to a stop in 5 sec.

- (A) -3      (B) -6      (C) -15      (D) -25      (E) -30

7. The equation of the curve whose slope at point  $(x, y)$  is  $x^2 - 2$  and which contains the point  $(1, -3)$  is

(A)  $y = \frac{1}{3}x^3 - 2x$       (B)  $y = 2x - 1$       (C)  $y = \frac{1}{3}x^3 - \frac{10}{3}$

(D)  $y = \frac{1}{3}x^3 - 2x - \frac{4}{3}$       (E)  $3y = x^3 - 10$

8.  $\int \frac{dx}{x^2 + 2x + 2} =$

(A)  $\ln(x^2 + 2x + 2) + C$       (B)  $\ln|x + 1| + C$       (C)  $\arctan(x + 1) + C$

(D)  $\frac{1}{\frac{1}{3}x^3 + x^2 + 2x} + C$       (E)  $-\frac{1}{x} + \frac{1}{2}\ln|x| + \frac{x}{2} + C$

