

**Math2B - Practice Final**

March 11, 2009

1.  $\int_0^1 (1-x)^9 dx =$   
(A)  $\frac{-1}{9}$  (B)  $\frac{1}{10}$  (C)  $\frac{-1}{10}$  (D)  $\frac{1}{9}$ .
2.  $f(x) = x^3 + 4x - 1$ , the derivative of  $f^{-1}(x)$  at  $x = -1$  is  
(A)  $\frac{1}{7}$  (B) 7 (C)  $\frac{1}{4}$  (D) 4.
3. The derivative of  $y = \ln(x^2 e^x)$  is  
(A)  $\frac{2}{x} + 1$  (B)  $\frac{1}{x^2 e^x}$  (C)  $\frac{2}{x}$  (D)  $\frac{1}{x} + 1$ .
4.  $\lim_{x \rightarrow 0} \frac{\cos x}{x^2} =$   
(A)  $-\frac{1}{2}$  (B)  $\frac{1}{2}$  (C) 0 (D)  $\infty$ .
5.  $\lim_{x \rightarrow 0^+} x^x =$   
(A) 0 (B) 1 (C) -1 (D)  $\infty$
6.  $\int \frac{x+9}{x^2+9} =$   
(A)  $\ln \sqrt{x^2+9} + \arctan(\frac{x}{3})$  (B)  $\ln(x^2+9) + \arctan(\frac{x}{3})$  (C)  $\ln \sqrt{x^2+9} + 3 \arctan(\frac{x}{3})$   
(D)  $\ln(x^2+9) + 3 \arctan(\frac{x}{3})$ .
7.  $\tan(\arcsin \frac{1}{2}) =$   
(A)  $\sqrt{3}$  (B)  $\frac{1}{\sqrt{3}}$  (C)  $\frac{\sqrt{3}}{2}$  (D)  $\frac{2}{\sqrt{3}}$ .
8. The length of  $y = \frac{4}{3}\sqrt{x^3}, 0 \leq x \leq 1$  is  
(A)  $\frac{2(\sqrt{125}-1)}{3}$  (B)  $\frac{\sqrt{125}-1}{6}$  (C)  $\frac{2(\sqrt{5}-1)}{3}$  (D)  $\frac{\sqrt{5}-1}{6}$
9.  $\int_2^5 \frac{1}{\sqrt{x-2}} dx =$   
(A) Divergent (B)  $2\sqrt{3}$  (C)  $-2\sqrt{3}$  (D)  $\sqrt{3}$ .
10. The derivative of  $3^{2x}$  is  
(A)  $3^{2x}$  (B)  $23^{2x} \ln 3$  (C)  $\frac{1}{2}3^{2x} \ln 3$  (D)  $3^{2x} \ln 3$

11. (a) Find the area of the region bounded by  $x + y = 0$ ,  $x = y^2 + 3y$ .  
(b): Find the volume of the solid obtained by the rotating  $y = x^2 + 1$ ,  $y = 9 - x^2$  about  $y = -1$ .
12. (a) Evaluate  $\int_1^e 4t^2 \ln t dt$   
(b) Evaluate  $\int_{\sqrt{2}}^2 \frac{1}{x^3 \sqrt{(x^2-1)}} dx$ .
13. (a) Evaluate  $\int \cos^5 x \sin^4 x dx$ .  
(b) Evaluate  $\int_0^{\pi/3} \tan^5 x \sec^4 x dx$ .
14. (a) Evaluate  $\int_2^3 \frac{1}{x^2-1} dx$ .  
(b) Evaluate the improper integral  $\int_0^1 \ln x dx$ .
15. (a) Evaluate  $\int \frac{e^{2x}}{e^{2x}+3e^x+2} dx$   
(b) Evaluate  $\int_1^2 x^4 (\ln x)^2 dx$ .