# Math2B - Practice Final

March 15, 2007

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. The average value of the function $f(x) = \cos^4 x \sin x$ on $[0, \pi]$ is
(A) $\frac{2}{5}$ (B) $\frac{2}{5\pi}$ (C) $\frac{-2}{5}$ (D) $\frac{-2}{5\pi}$.

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. The solution(s) of $\ln(x+1) + \ln(x-1) = 1$ is(are)
(A) $\sqrt{2}, -\sqrt{2}$ (B) $\sqrt{2}$ (C) $\sqrt{1+e}, -\sqrt{1+e}$ (D)$\sqrt{1+e}$.

5. $\lim_{x \to 0^+} x^x =$
(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 $y = \frac{4}{3}\sqrt{x^3}, 0 \le x \le 1$ 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. $\int \sin 4x \cos 5x =$
(A) $\frac{1}{2}(\cos x - \frac{1}{9}\cos 9x) + C$ (B) $\frac{1}{2}(\sin x - \frac{1}{9}\sin 9x) + C$ (C) $\frac{1}{2}(\cos x + \frac{1}{9}\cos 9x) + C$
(C) $\frac{1}{2}(\sin x + \frac{1}{9}\sin 9x) + C$

11. (a) Find the are 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) Evaulate $\int \cos^5 x \sin^4 x dx$.
    (b) Evaulate $\int_0^{\pi/3} \tan^5 x \sec^4 x dx$.

14. (a) Evaluate $\int_2^3 \frac{1}{x^2-1} dx$.
    (b) Evalute the improper integral $\int_0^1 \ln x dx$.

15. (a) Evaluate $\int \frac{e^{2x}}{e^{2x}+3e^x+2} dx$
    (b) Evalute $\int_1^2 x^4 (\ln x)^2 dx$.