Mathematics 030 Test 1 Friday, October 15, 2004

INSTRUCTIONS: Use an HB pencil on the scantron card. Circle the correct answer to each question on this paper. You must hand in question paper, your scantron card and any rough work sheets. NO CALCULATORS ARE ALLOWED!

1. Simplify $\log_5 2 - \log_5 50$.

A: -100	B: -48	C: -2	D: $\frac{1}{25}$	E: 25

2. If $f(x) = xe^x$, find $f'(\ln 3)$.

A: 0	B: 3	C: $\ln 3$	D: $3\ln 3$	E: $3 + 3\ln 3$

3. If $f(x) = \dfrac{\ln x}{x^4}$, find $f'(e)$.

A: $-\frac{5}{e}$	B: $-\frac{2}{e^3}$	C: $-\frac{1}{e^4}$	D: $-\frac{3}{e^5}$	E: $-\frac{4}{e^8}$

4. Find the slope of the tangent line to the graph of $y = 7^x$ at the point where $x = 1$.

A: 0	B: 7	C: $\ln 7$	D: $\frac{7}{\ln 7}$	E: $7\ln 7$

5. Find $\dfrac{dy}{dx}$ where $y = (x+1)^{3x}$.

A: $3x(x+1)^{3x-1}$	B: $(x+1)^{3x}3\ln(x+1)$	C: $\frac{3(x+1)^{3x}}{x+1}$
D: $(x+1)^{3x}\left[3\ln(x+1) + \frac{3x}{x+1}\right]$	E: $(x+1)^{3x}\left[\ln(x+1) + \frac{x}{x+1}\right]$	

6. If $\dfrac{6x-25}{(x-3)(x+4)} = \dfrac{A}{x-3} + \dfrac{B}{x+4}$, find A.

A: 1	B: -1	C: 7	D: -7	E: 3

7. Find $\displaystyle\int xe^{x^2}dx$.

A: $e^{x^2} + C$	B: $\frac{1}{2}e^{x^2} + C$	C: $2e^{x^2} + C$
D: $\frac{x^2}{2}e^{x^2} + C$	E: $\frac{x^2}{2}\left(\frac{e^{x^2}}{2x}\right) + C$	

8. $\displaystyle\int xe^{5x}dx =$

A: $\frac{1}{5}xe^{5x} - \int \frac{1}{5}e^{5x}dx$	B: $5xe^{5x} - \int 5e^{5x}dx$	C: $xe^{5x} - \int e^{5x}dx$
D: $\frac{x^2}{2}e^{5x} + C$	E: $\frac{x^2}{2}\frac{e^{5x+1}}{(5x+1)} + C$	

9. Evaluate $\displaystyle\int_1^2 \frac{x+1}{x}\,dx$.

A: $\ln 3$	B: $1 + \ln 3$	C: $2 + \ln 3$	D: $2 + \ln 2$	E: $1 + \ln 2$

10. Evaluate $\displaystyle\int_0^1 \frac{x^2}{(1+x^3)^2}\,dx$.

A: $\frac{1}{2}$	B: $-\frac{1}{2}$	C: $-\frac{1}{6}$	D: $\frac{1}{6}$	E: $-\frac{1}{3}$