Diagnostic Test

1. $\int \frac{3}{124-2t}\,dt =$

2. TRUE/FALSE ?

   (a) $e^{(a+b)} = e^a + e^b$

   (b) $\frac{d}{dx}\{\ln(2x)\} = \frac{1}{x}$

   (c) $\det\begin{pmatrix} 3 & 2 \\ 2 & -1 \end{pmatrix} = -7$

   (d) $\int_0^{\frac{1}{\sqrt{6}}} 2x\,\cos(\pi x^2)\,dx = \frac{1}{2\pi}$

   (e) $y = x^2 + x^3$ satisfies the equation $\frac{dy}{dx} = 2x + 3y - 3x^3$

3. If $M(x,y) = \frac{1}{y^2(1+x^2)} + \frac{2}{x} + 2x\sin 2y$ and $N(x,y) = 2x^2\cos 2y - \frac{2\tan^{-1}x}{y^3}$, then $\left(\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}\right) =$

4. $\int_0^1 te^{2t}\,dt =$

5. $\int \frac{10}{x^2+2x+5}\,dx =$

6. If $y = y(x)$ is defined implicitly by the equation $x^3e^{-2y} + \cos(y^2) = 2x$, then $\frac{dy}{dx} =$

7. Find the form of the partial fraction decomposition for $\frac{2+x-4x^3}{x^5+8x^2}$.

8. $\int \frac{y-6}{y^2-2y}\,dy =$

9. $\int_1^\infty \frac{\ln x}{x^3}\,dx =$

10. Find the solution of the system $\begin{cases} x_1 - 2x_2 = 0 \\ -2x_1 + 4x_2 = 0 \end{cases}$