Date: _____

1. $\int (2x^2 - 2x - 1 + \sin x - \cos x + \ln x + e^x)\,dx =$

$= \frac{2x^3}{3} - x^2 - 2x - \cos(x) - \sin(x) + x\ln x + e^x +$

$+ C$

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2. $\int (2x + 6xz^2 - 5x^2y - 3\ln z)\,dx =$

$= -3\ln(z)x - \frac{5x^3y}{3} + (6z^2 + 2)\cdot\frac{x^2}{2} + C =$

$= -\frac{5x^3y}{3} + 3x^2z^2 + x^2 - 3x\ln(z) + C$

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4. $\int \frac{1}{\sqrt{x+1}}\,dx = \int \frac{1}{\sqrt{y}}\,dy$ $\quad y = x+1$

$= 2\sqrt{y} + C \Rightarrow 2\sqrt{x+1} + C$

$$3.\ \int_0^{\pi} 3x^2 \sin(2x)\,dx =$$

$$\left(-\frac{3}{2}x^2\cos(2x)\right)\Big|_0^{\pi} + 3\int_0^{\pi} x\cos(2x)\,dx =$$

$$= -\frac{3\pi^2}{2} + \frac{3}{2}x\sin(2x)\Big|_0^{\pi} - \frac{3}{2}\int_0^{\pi}\sin(2x)\,dx =$$

$$= -\frac{3\pi^2}{2} + \frac{3}{4}\int_0^{2\pi}\sin(y)\,dy \qquad y = 2x$$

$$= \rightarrow 0$$

$$= -\frac{3\pi^2}{2}$$