

1. Find the value of the integrals

$$\int_0^1 x \sin(x^2) dx, \quad \int_0^1 \sin(x) \cos(x) dx.$$

2. A matrix with mis-matched delimiters and peculiar alignment $\left(\begin{array}{ccc} 1 & 2 & 44 \\ 321 & 22 & 111 \end{array} \right|$.

3. Some derivatives $\frac{df}{dx} = f'(x)$.

4. Find the limit,

$$\lim_{x \rightarrow \infty} (\sqrt[3]{x^3 + 2x} - x)$$