

Physics 3513, Homework #3 (due 9/17)

The numbers in parentheses after the problem number indicate points for each problem.

P1(10) (Boas 2.7) Solve $\begin{cases} 2x + 3y = 1 \\ x + 2y = 2 \\ x + 3y = 5 \end{cases}$

P2(10) (Boas 2.10) Solve $\begin{cases} x + 2y - z = 1 \\ 2x + 3y - 2z = -1 \\ 3x + 4y - 3z = -4 \end{cases}$

P3(10) (Boas 2.11) Solve $\begin{cases} x - 2y = 4 \\ 5x + z = 7 \\ x + 2y - z = 3 \end{cases}$

P4(10) (Boas 3.3) Evaluate $\begin{vmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & 3 & 4 \\ 1 & 3 & 6 & 10 \\ 1 & 4 & 10 & 20 \end{vmatrix}$

P5(10) (Boas 3.6) Calculate $\begin{vmatrix} 0 & 1 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 & 1 \\ 1 & 1 & 0 & 1 & 1 \\ 1 & 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 & 0 \end{vmatrix}$

P6(10) (Boas 6.1) Let $A = \begin{pmatrix} 3 & 1 \\ 2 & 5 \end{pmatrix}$, $B = \begin{pmatrix} -2 & 2 \\ 1 & 4 \end{pmatrix}$. Find AB , BA , $A + B$, $A - B$

P7(10) (Boas, from 6.17) Let $A = \begin{pmatrix} 1 & 0 & 1 \\ 2 & 1 & 1 \\ 2 & 1 & 2 \end{pmatrix}$. Calculate A^{-1}

P8(10) Evaluate $\begin{vmatrix} \cos \alpha & \sin \alpha & \cos \alpha \\ \sin \alpha & \cos \alpha & -\sin \alpha \\ 0 & \sin 2\alpha & \cos 2\alpha \end{vmatrix}$

P9(10) For an arbitrary 2×2 matrix A , evaluate $A^2 - A \operatorname{Tr} A + I \det A$

P10(10) Evaluate $\begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}^n$