Determinants I

Problem Set

Problem 1. Recall that a matrix A is called *idempotent* if $A^2 = A$. Show that every idempotent matrix A satisfies $\det(A) = 1$ or $\det(A) = 0$.

Problem 2. Consider two matrices A and B of the form

$$A = \begin{bmatrix} \text{Row}_1 \\ \text{Row}_2 \\ \text{Row}_3 \end{bmatrix} \qquad\qquad B = \begin{bmatrix} \text{Row}_1 + \text{Row}_2 + \text{Row}_3 \\ \text{Row}_1 + \text{Row}_2 \\ \text{Row}_1 \end{bmatrix}$$

Suppose $\det(A) = -11$. Find $\det(B)$.