

# Homework

## MATH 132

Prof. Janet Vassilev

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**The following problems will be starred problems for January 30.**

1. Find the projection matrix of  $\mathbb{R}^4$  onto the subspace spanned by  $(\frac{5}{13}, 0, \frac{12}{13}, 0)$  and  $(\frac{5}{13}, 0, -\frac{12}{13}, 0)$ .
2. Find the projection matrix of  $\mathbb{R}^3$  onto the subspace spanned by  $(\frac{\sqrt{3}}{3}, \frac{\sqrt{3}}{3}, -\frac{\sqrt{3}}{3})$  and  $(\frac{\sqrt{2}}{2}, 0, \frac{\sqrt{2}}{2})$ .
3. Let  $P$  be an  $n \times n$  matrix such that  $P^2 = P$  and every vector in  $N(P)$  is orthogonal to every vector in the column space of  $P$ . Show  $P$  is a projection matrix.