

GRAM-SCHMIDT ORTHOGONALIZATION WORKSHEET

NOVEMBER 6, 2017

Let

$$A = \begin{pmatrix} 3 & -5 & 1 \\ 1 & 1 & 1 \\ -1 & 5 & -2 \\ 3 & -7 & 8 \end{pmatrix}.$$

- (1) Use the Gram-Schmidt orthogonalization process to compute an orthogonal basis for $\text{Col}(A)$.

(2) Normalize your basis from the previous part to obtain an orthonormal basis for $\text{Col}(A)$.

(3) Compute the QR factorization of A . (*Hint*: $R = Q^T A$. Why is this true?)