Math 2802 N1-N3 Quiz

April 6th, 2018

The quiz has a total of 10 points and you have 15 minutes. Read carefully and clearly justify how you obtained your answers.

1. [2pts] Let $Q(x_1, x_2, x_3) = 2x_1x_2 - 4x_1x_3 - x_2x_3 - x_3^2$. Give the matrix associated to the quadratic form $Q(x)$.

2. [4 pts] Classify the following quadratic functions:

    a) $Q(x_1, x_2) = 2x_2^2 - 2x_1^2$,

    b) $Q(x_1, x_2) = -3x_1^2$.

3. [4 pts] The 2×2 matrix A can be written as $A = PDP^{-1}$ with $D = \begin{pmatrix} d_1 & 0 \\ 0 & d_2 \end{pmatrix}$ and P orthonormal matrix. If u_1, u_2 are the columns vectors of P, write the formula for the spectral decomposition of A.