1. **(1 pt) Library/Rochester/setLinearAlgebra23QuadraticForms-/ur_la_23_1.pg**
Write the matrix of the quadratic form
$Q(x) = -9x_1^2 + 2x_2^2 - 1x_3^2 - 1x_1x_2 + 3x_1x_3 - 9x_2x_3$.
$A = \begin{bmatrix} \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ \end{bmatrix}$.

2. **(1 pt) Library/Rochester/setLinearAlgebra23QuadraticForms-/ur_la_23_2.pg**
Find the eigenvalues of the matrix

$M = \begin{bmatrix} -55 & 5 \\ 5 & -55 \end{bmatrix}$.

Enter the two eigenvalues, separated by a comma:

_____

Classify the quadratic form $Q(x) = x^T Ax$:

- A. $Q(x)$ is indefinite
- B. $Q(x)$ is negative definite
- C. $Q(x)$ is positive definite
- D. $Q(x)$ is positive semidefinite
- E. $Q(x)$ is negative semidefinite

3. **(1 pt) Library/Rochester/setLinearAlgebra23QuadraticForms-/ur_la_23_3.pg**
The matrix

$A = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & 0 \\ 0 & 0 & 4 \end{bmatrix}$

has three distinct eigenvalues, $\lambda_1 < \lambda_2 < \lambda_3$,
$\lambda_1 =$___,
$\lambda_2 =$___,
$\lambda_3 =$___.
Classify the quadratic form $Q(x) = x^T Ax$:

- A. $Q(x)$ is positive definite
- B. $Q(x)$ is positive semidefinite
- C. $Q(x)$ is indefinite
- D. $Q(x)$ is negative definite
- E. $Q(x)$ is negative semidefinite

4. **(1 pt) Library/Rochester/setLinearAlgebra23QuadraticForms-/ur_la_23_4.pg**
If $A = \begin{bmatrix} 2 & 8 \\ 8 & 3 \end{bmatrix}$ and $Q(x) = x \cdot Ax$,
Then $Q(e_1) =$ ___ and $Q(e_2) =$ ___.

5. **(1 pt) Library/Rochester/setLinearAlgebra23QuadraticForms-/ur_la_23_5.pg**
If $A = \begin{bmatrix} 2 & -6 & 9 \\ -6 & 6 & -5 \\ 9 & -5 & -7 \end{bmatrix}$ and $Q(x) = x \cdot Ax$,
Then $Q(x_1, x_2, x_3) =$ ___ $x_1^2 +$ ___ $x_2^2 +$ ___ $x_3^2 +$ ___ $x_1x_2 +$ ___ $x_1x_3 +$ ___ x_2x_3.