This is an **ungraded quiz.** This means that, even though you will get a grade for the quiz, the **quiz score will not count in your final grade**.

1. Solve the following system of equations using the method of elimination and select the correct answer. 1 point

$$\begin{cases} x + y = 4 \\ -6x + 2y = 16 \end{cases}$$

- (●) $x = -1, y = 5$.
- ( ) The system has no solution.
- ( ) $x = 0, y = 0$.
- ( ) $x = 1, y = 3$.
- ( ) The system has infinitely many solutions.

2. Calculate the determinant of the following matrix and determine if it is singular or non-singular: 1 point

$$A = \begin{bmatrix} 4 & -3 \\ 7 & -8 \end{bmatrix}$$

- ( ) $\det(A) = -53$. The matrix is non-singular.
- ( ) $\det(A) = -11$. The matrix is singular.
- (●) $\det(A) = -11$. The matrix is non-singular.
- ( ) $\det(A) = -53$. The matrix is singular.

3. Calculate the determinant of the following matrix and determine if it is singular or non-singular: 1 point

$$\begin{bmatrix} -3 & 8 & 1 \\ 2 & 2 & -1 \\ -5 & 6 & 2 \end{bmatrix}$$

- ( ) -80. Non-singular.
- (●) 0. Singular.
- ( ) 0. Non-singular.
- ( ) -20. Non-singular.
- ( ) 36. Non-singular.

4. Determine if the provided matrix has linearly dependent or independent rows (a, b, c, d, e, f are real numbers): 1 point

$$\begin{bmatrix} a & b & c \\ d & e & f \\ 2a - d & 2b - e & 2c - f \end{bmatrix}$$

Hint: Can one row in the matrix be obtained as a result of operations on the other rows?

- ( ) Independent
- (●) Dependent
- ( ) It cannot be determined.

5. Which of the following operations, when applied to the rows of the matrix, do not change the singularity (or non-singularity) of the matrix: 1 point

- [x] Adding one row to another one.
- [x] Multiplying a row by a nonzero scalar.
- [x] Switching rows.
- [ ] Adding a nonzero fixed value to every entry of the row.

6. In the following matrix: 1 point

$$\begin{bmatrix} x & x \\ y & z \end{bmatrix}$$

x, y, and z are **non-zero** real numbers. If the matrix is **non-singular,** which of the following must be true:

- ( ) $z = x$ only if $x = y$.
- ( ) $z = y$.
- (●) $x = y$ only if $z \neq x$.