Congratulations! You passed!

Grade received 100% To pass 80% or higher

Go to next item

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

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

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

Correct
Correct! The solution for the system of equations is a unique point at x = -1, y = 5, as shown:
$$\begin{cases} -1 + 5 = 4 \\ -6(-1) + 2 * 5 = 16 \end{cases}$$

2. For the questions 2-3, calculate the determinant of the matrices and determine if the matrices are singular or non-singular: 1 / 1 point

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

- ( ) -53, Singular
- ( ) -53, Non-singular
- ( ) -11, Singular
- (●) -11, Non-singular

Correct
Correct! You can compute the determinant of a two-by-two matrix using the formula *ad - bc*, as explained in the video: "Singular vs Non-singular Matrices".

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

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

Correct
Correct! As explained in the video "Determinant for larger matrices", you can use the formula *aei + bfg + cdh - afh - bdi - ceg* to calculate the determinant of a three-by-three matrix. If the determinant is zero, then the matrix is singular.

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

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

Correct
Great work! Row 3 can be obtained by adding (2 * row 1) + (-1 * row 2).

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 / 1 point

- [x] Adding a row to another one.

Correct
Correct!

- [x] Multiplying a row by a nonzero scalar.

Correct
Correct!

- [x] Switching rows.

Correct
Well done!

- [ ] Adding a nonzero fixed value to every entry of the row.

6. In the following matrix: 1 / 1 point

$$\begin{bmatrix} a & a \\ b & c \end{bmatrix}$$

a, b, and c are non-zero real numbers. If the matrix is non-singular, which of the following must be true:

- [ ] c = a only if a = b
- [x] a = b only if c ≠ a

Correct
Correct! You can compute the determinant of a matrix using the formula *ad - bc*.Please double-check if you did the calculation correctly.

- [ ] c = b
- [x] c ≠ b

Correct
Correct! You can compute the determinant of a matrix using the formula *ad - bc*. Use this formula and the fact that the matrix is non-singular to solve this question.

7. Luis went yesterday to the bank to find out the interest rate of three different financial instruments. He received 1 / 1 point

the following information:

Financial instrument	Savings account	Certificate of Deposit (CD)	Bonds
Annual interest	2%	3%	4%

He wants to invest his USD $10,000 savings in these three accounts. By doing so, he knows that after a year he would receive a total of US $ 260 in interest if he put twice as much money in the savings account as in the CDs, and "z" money in bonds.

Calculate the value of "z" , in USD, using the elimination method explained in the lectures.

- It cannot be determined.
- $z = \text{USD } \$5600$
- $z = \text{USD } \$1600$
- $z = \text{USD } \$2800$

Correct
Correct! He needs to invest US $1.600 in bonds, US $5.600 in the savings account and US $2.800 in CDs.