


Congratulations! You passed!

Grade received **96.43%** 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

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

- ☐ The system has infinitely many solutions.
☐ $x = 0, y = 0$
☒ $x = -1, y = 5$
☐ $x = 1, y = 3$
☐ 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:

$$\begin{cases} -1 + 5 = 4 \\ -6(-1) + 2 \cdot 5 = 16 \end{cases}$$

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

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

- ☒ -11, Non-singular
☐ -11, Singular
☐ -53, Singular
☐ -53, 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?

- ☐ It cannot be determined.
☐ Independent
☐ Dependent

☒ Dependent



Correct

Great work! Row 3 can be obtained by adding $(2 * \text{row } 1) + (-1 * \text{row } 2)$.

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

☒ Switching rows.



Correct

Well done!

☒ Multiplying a row by a nonzero scalar.



Correct

Correct!

☐ Adding a nonzero fixed value to every entry of the row.

☒ Adding a row to another one.



Correct

Correct!

6. In the following matrix:

0.75 / 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:

☐ a = b only if $c \neq a$

☐ c = a only if $a = b$

☒ $c \neq b$



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.

☐ c = b

You didn't select all the correct answers

7. Luis went yesterday to the bank to find out the interest rate of three different financial instruments. He received the following information:

1 / 1 point

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.

☒ z = USD \$1600

☐ It cannot be determined.

☐ z = USD \$2800

☐ z = USD \$5600



Correct

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