姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 103: Linear Algebra I

Let

$$\mathbf{A} = \begin{bmatrix} 1 & 4 & -4 \\ -4 & -15 & 15 \\ -6 & -22 & 23 \\ -24 & -89 & 90 \end{bmatrix} \text{ and } \mathbf{b} = \begin{bmatrix} -26 \\ 98 \\ 146 \\ 584 \end{bmatrix}.$$

Suppose β is the basis formed by the columns of $\mathbf{A}$. Find $\mathrm{Repr}_\beta(\mathbf{b})$.

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10

Solution.

Solve the system of linear equations $\mathbf{Ax} = \mathbf{b}$, using Gaussian elimination or any method you like. The answer is

$$\mathrm{Repr}_\beta(\mathbf{b}) = \mathbf{x} = \boxed{\begin{bmatrix} -2 \\ -4 \\ 2 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10 = 6.

SolComb 1

Indicating your answer by **underlining it** or **circling it**.
Compute the **check code** and fill it into the **box on the right**.

check code

6

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 103: Linear Algebra I

Let

$$\mathbf{A} = \begin{bmatrix} 1 & -4 & -4 \\ -3 & 13 & 12 \\ 8 & -33 & -31 \\ -29 & 122 & 114 \end{bmatrix} \text{ and } \mathbf{b} = \begin{bmatrix} 8 \\ -29 \\ 73 \\ -270 \end{bmatrix}.$$

Suppose β is the basis formed by the columns of $\mathbf{A}$. Find $\mathrm{Repr}_\beta(\mathbf{b})$.

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10

Solution.

Solve the system of linear equations $\mathbf{Ax} = \mathbf{b}$, using Gaussian elimination or any method you like. The answer is

$$\mathrm{Repr}_\beta(\mathbf{b}) = \mathbf{x} = \boxed{\begin{bmatrix} 4 \\ -5 \\ 4 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10 = 3.

Indicating your answer by **underlining it** or **circling it**.
Compute the **check code** and fill it into the **box on the right**.

check code

3

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 103: Linear Algebra I

Let

$$\mathbf{A} = \begin{bmatrix} 1 & 4 & 3 \\ 0 & 1 & -3 \\ 4 & 21 & -2 \\ -14 & -72 & 2 \end{bmatrix} \text{ and } \mathbf{b} = \begin{bmatrix} -10 \\ -11 \\ -93 \\ 308 \end{bmatrix}.$$

Suppose β is the basis formed by the columns of $\mathbf{A}$. Find $\mathrm{Repr}_\beta(\mathbf{b})$.

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10

Solution.

Solve the system of linear equations $\mathbf{Ax} = \mathbf{b}$, using Gaussian elimination or any method you like. The answer is

$$\mathrm{Repr}_\beta(\mathbf{b}) = \mathbf{x} = \boxed{\begin{bmatrix} 4 \\ -5 \\ 2 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10 = 1.

SolComb 3

Indicating your answer by **underlining it** or **circling it**.
Compute the **check code** and fill it into the **box on the right**.

check code

1

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 103: Linear Algebra I

Let

$$\mathbf{A} = \begin{bmatrix} 1 & -1 & -4 \\ 2 & -1 & -7 \\ -11 & 7 & 41 \\ -25 & 16 & 92 \end{bmatrix} \text{ and } \mathbf{b} = \begin{bmatrix} 24 \\ 42 \\ -245 \\ -551 \end{bmatrix}.$$

Suppose β is the basis formed by the columns of $\mathbf{A}$. Find $\mathrm{Repr}_\beta(\mathbf{b})$.

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10

Solution.

Solve the system of linear equations $\mathbf{Ax} = \mathbf{b}$, using Gaussian elimination or any method you like. The answer is

$$\mathrm{Repr}_\beta(\mathbf{b}) = \mathbf{x} = \boxed{\begin{bmatrix} 3 \\ -1 \\ -5 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10 = 7.

SolComb 4

Indicating your answer by **underlining it** or **circling it**.
Compute the **check code** and fill it into the **box on the right**.

check code

7

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 103: Linear Algebra I

Let

$$\mathbf{A} = \begin{bmatrix} 1 & 0 & 5 \\ -5 & 1 & -22 \\ -23 & 5 & -99 \\ 92 & -20 & 397 \end{bmatrix} \text{ and } \mathbf{b} = \begin{bmatrix} 6 \\ -24 \\ -106 \\ 426 \end{bmatrix}.$$

Suppose β is the basis formed by the columns of $\mathbf{A}$. Find $\mathrm{Repr}_\beta(\mathbf{b})$.

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10

Solution.

Solve the system of linear equations $\mathbf{Ax} = \mathbf{b}$, using Gaussian elimination or any method you like. The answer is

$$\mathrm{Repr}_\beta(\mathbf{b}) = \mathbf{x} = \boxed{\begin{bmatrix} -4 \\ 0 \\ 2 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10 = 8.

SolComb 5

Indicating your answer by **underlining it** or **circling it**.
Compute the **check code** and fill it into the **box on the right**.

check code

8

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 103: Linear Algebra I

Let

$$\mathbf{A} = \begin{bmatrix} 1 & 2 & -1 \\ -5 & -9 & 0 \\ -23 & -42 & 4 \\ -5 & -8 & -5 \end{bmatrix} \text{ and } \mathbf{b} = \begin{bmatrix} -9 \\ 45 \\ 206 \\ 45 \end{bmatrix}.$$

Suppose β is the basis formed by the columns of $\mathbf{A}$. Find $\mathrm{Repr}_\beta(\mathbf{b})$.

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10

Solution.

Solve the system of linear equations $\mathbf{Ax} = \mathbf{b}$, using Gaussian elimination or any method you like. The answer is

$$\mathrm{Repr}_\beta(\mathbf{b}) = \mathbf{x} = \boxed{\begin{bmatrix} 0 \\ -5 \\ -1 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10 = 4.

SolComb 6

Indicating your answer by **underlining it** or **circling it**.
Compute the **check code** and fill it into the **box on the right**.

check code

4

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 103: Linear Algebra I

Let

$$\mathbf{A} = \begin{bmatrix} 1 & -3 & 1 \\ -5 & 16 & 0 \\ 16 & -52 & -3 \\ 67 & -217 & -9 \end{bmatrix} \text{ and } \mathbf{b} = \begin{bmatrix} -16 \\ 73 \\ -230 \\ -968 \end{bmatrix}.$$

Suppose β is the basis formed by the columns of $\mathbf{A}$. Find $\mathrm{Repr}_\beta(\mathbf{b})$.

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10

Solution.

Solve the system of linear equations $\mathbf{Ax} = \mathbf{b}$, using Gaussian elimination or any method you like. The answer is

$$\mathrm{Repr}_\beta(\mathbf{b}) = \mathbf{x} = \boxed{\begin{bmatrix} -5 \\ 3 \\ -2 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10 = 6.

SolComb 7

Indicating your answer by **underlining it** or **circling it**.
Compute the **check code** and fill it into the **box on the right**.

check code

6

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 103: Linear Algebra I

Let

$$\mathbf{A} = \begin{bmatrix} 1 & 0 & 1 \\ -2 & 1 & -5 \\ 1 & -3 & 11 \\ 3 & -11 & 39 \end{bmatrix} \text{ and } \mathbf{b} = \begin{bmatrix} 3 \\ -20 \\ 50 \\ 178 \end{bmatrix}.$$

Suppose β is the basis formed by the columns of $\mathbf{A}$. Find $\mathrm{Repr}_\beta(\mathbf{b})$.

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10

Solution.

Solve the system of linear equations $\mathbf{Ax} = \mathbf{b}$, using Gaussian elimination or any method you like. The answer is

$$\mathrm{Repr}_\beta(\mathbf{b}) = \mathbf{x} = \boxed{\begin{bmatrix} -2 \\ 1 \\ 5 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10 = 4.

SolComb 8

Indicating your answer by **underlining it** or **circling it**.
Compute the **check code** and fill it into the **box on the right**.

check code

4

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 103: Linear Algebra I

Let

$$\mathbf{A} = \begin{bmatrix} 1 & 4 & 0 \\ -3 & -11 & -1 \\ 12 & 43 & 6 \\ 41 & 149 & 18 \end{bmatrix} \text{ and } \mathbf{b} = \begin{bmatrix} 18 \\ -46 \\ 172 \\ 606 \end{bmatrix}.$$

Suppose β is the basis formed by the columns of $\mathbf{A}$. Find $\mathrm{Repr}_\beta(\mathbf{b})$.

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10

Solution.

Solve the system of linear equations $\mathbf{Ax} = \mathbf{b}$, using Gaussian elimination or any method you like. The answer is

$$\mathrm{Repr}_\beta(\mathbf{b}) = \mathbf{x} = \boxed{\begin{bmatrix} 2 \\ 4 \\ -4 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10 = 2.

SolComb 9

Indicating your answer by **underlining it** or **circling it**.
Compute the **check code** and fill it into the **box on the right**.

check code

2

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 103: Linear Algebra I

Let

$$\mathbf{A} = \begin{bmatrix} 1 & 1 & 2 \\ -5 & -4 & -6 \\ -12 & -10 & -15 \\ -53 & -44 & -65 \end{bmatrix} \text{ and } \mathbf{b} = \begin{bmatrix} -2 \\ 17 \\ 41 \\ 184 \end{bmatrix}.$$

Suppose β is the basis formed by the columns of $\mathbf{A}$. Find $\mathrm{Repr}_\beta(\mathbf{b})$.

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10

Solution.

Solve the system of linear equations $\mathbf{Ax} = \mathbf{b}$, using Gaussian elimination or any method you like. The answer is

$$\mathrm{Repr}_\beta(\mathbf{b}) = \mathbf{x} = \boxed{\begin{bmatrix} -3 \\ -5 \\ 3 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Repr}_\beta(\mathbf{b})$) mod 10 = 5.

SolComb 10

Indicating your answer by **underlining it** or **circling it**.
Compute the **check code** and fill it into the **box on the right**.

check code

5