姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 1 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} -2 & 2 & 1 \\ -1 & 0 & 0 \\ 1 & 1 & -2 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 2 & 0 \\ -2 & -3 & 1 \\ -2 & -3 & 2 \end{bmatrix}.$$

Suppose $f : \mathbb{R}^3 \to \mathbb{R}^3$ is a homomorphism defined by $f(\mathbf{v}) = A\mathbf{v}$ for all $\mathbf{v} \in \mathbb{R}^3$ and $\mathcal{B}$ is a basis of $\mathbb{R}^3$ composed of the columns of B. Find $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10

Solution.

Let $\mathbf{v}_j$ be the j-th column of B. Then $f(\mathbf{v}_j)$'s can be computed as

$$A\mathbf{v}_1 = \begin{bmatrix} -8 \\ -1 \\ 3 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} -13 \\ -2 \\ 5 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} 4 \\ 0 \\ -3 \end{bmatrix}$$

and $\text{Rep}_{\mathcal{B}}(f(\mathbf{v}_j))$'s are

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 34 \\ -21 \\ 4 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 57 \\ -35 \\ 7 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -18 \\ 11 \\ -3 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 34 & 57 & -18 \\ -21 & -35 & 11 \\ 4 & 7 & -3 \end{bmatrix}}.$$

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 6.

MatRep 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 1 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} 2 & 2 & -2 \\ -2 & 2 & 1 \\ 1 & -1 & 1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 0 & -2 \\ -1 & 1 & 2 \\ -1 & 2 & 3 \end{bmatrix}.$$

Suppose $f : \mathbb{R}^3 \to \mathbb{R}^3$ is a homomorphism defined by $f(\mathbf{v}) = A\mathbf{v}$ for all $\mathbf{v} \in \mathbb{R}^3$ and $\mathcal{B}$ is a basis of $\mathbb{R}^3$ composed of the columns of B. Find $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10

Solution.

Let $\mathbf{v}_j$ be the j-th column of B. Then $f(\mathbf{v}_j)$'s can be computed as

$$A\mathbf{v}_1 = \begin{bmatrix} 2 \\ -5 \\ 1 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} -2 \\ 4 \\ 1 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} -6 \\ 11 \\ -1 \end{bmatrix}$$

and $\text{Rep}_{\mathcal{B}}(f(\mathbf{v}_j))$'s are

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 20 \\ -3 \\ 9 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} -12 \\ 2 \\ -5 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -40 \\ 5 \\ -17 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 20 & -12 & -40 \\ -3 & 2 & 5 \\ 9 & -5 & -17 \end{bmatrix}}.$$

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 9.

MatRep 2

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

check code

9

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 1 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} -1 & 0 & -1 \\ 1 & 1 & -2 \\ -2 & 2 & -1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 1 & 2 \\ 1 & 0 & -3 \end{bmatrix}.$$

Suppose $f : \mathbb{R}^3 \to \mathbb{R}^3$ is a homomorphism defined by $f(\mathbf{v}) = A\mathbf{v}$ for all $\mathbf{v} \in \mathbb{R}^3$ and $\mathcal{B}$ is a basis of $\mathbb{R}^3$ composed of the columns of B. Find $\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

Check code = (sum of all entries of $\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10

Solution.

Let $\mathbf{v}_j$ be the j-th column of B. Then $f(\mathbf{v}_j)$'s can be computed as

$$A\mathbf{v}_1 = \begin{bmatrix} -2 \\ -1 \\ -3 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} -2 \\ 3 \\ -2 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} 3 \\ 8 \\ 7 \end{bmatrix}$$

and $\mathrm{Rep}_{\mathcal{B}}(f(\mathbf{v}_j))$'s are

$$\mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} -12 \\ 5 \\ -3 \end{bmatrix}, \mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 16 \\ -9 \\ 6 \end{bmatrix}, \text{ and } \mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} 67 \\ -32 \\ 20 \end{bmatrix}.$$

Thus,

$$\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} -12 & 16 & 67 \\ 5 & -9 & -32 \\ -3 & 6 & 20 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 8.

MatRep 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

8

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 1 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} -1 & -2 & -1 \\ -2 & -2 & 0 \\ 2 & 2 & 1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 0 & -1 \\ -2 & 1 & 0 \\ -5 & 2 & 2 \end{bmatrix}.$$

Suppose $f : \mathbb{R}^3 \to \mathbb{R}^3$ is a homomorphism defined by $f(\mathbf{v}) = A\mathbf{v}$ for all $\mathbf{v} \in \mathbb{R}^3$ and $\mathcal{B}$ is a basis of $\mathbb{R}^3$ composed of the columns of B. Find $\operatorname{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

Check code = (sum of all entries of $\operatorname{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10

Solution.

Let $\mathbf{v}_j$ be the j-th column of B. Then $f(\mathbf{v}_j)$'s can be computed as

$$A\mathbf{v}_1 = \begin{bmatrix} 8 \\ 2 \\ -7 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} -4 \\ -2 \\ 4 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} -1 \\ 2 \\ 0 \end{bmatrix}$$

and $\operatorname{Rep}_{\mathcal{B}}(f(\mathbf{v}_j))$'s are

$$\operatorname{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 5 \\ 12 \\ -3 \end{bmatrix}, \operatorname{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 0 \\ -2 \\ 4 \end{bmatrix}, \text{ and } \operatorname{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -6 \\ -10 \\ -5 \end{bmatrix}.$$

Thus,

$$\operatorname{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 5 & 0 & -6 \\ 12 & -2 & -10 \\ -3 & 4 & -5 \end{bmatrix}}.$$

Check code = (sum of all entries of $\operatorname{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 5.

MatRep 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

5

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 1 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 2 \\ -2 & 0 & 2 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 2 & -2 \\ -1 & -1 & 2 \\ 0 & 0 & 1 \end{bmatrix}.$$

Suppose $f : \mathbb{R}^3 \to \mathbb{R}^3$ is a homomorphism defined by $f(\mathbf{v}) = A\mathbf{v}$ for all $\mathbf{v} \in \mathbb{R}^3$ and $\mathcal{B}$ is a basis of $\mathbb{R}^3$ composed of the columns of B. Find $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10

Solution.

Let $\mathbf{v}_j$ be the j-th column of B. Then $f(\mathbf{v}_j)$'s can be computed as

$$A\mathbf{v}_1 = \begin{bmatrix} 0 \\ 1 \\ -2 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} 1 \\ 3 \\ -4 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} 1 \\ 0 \\ 6 \end{bmatrix}$$

and $\text{Rep}_{\mathcal{B}}(f(\mathbf{v}_j))$'s are

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} -6 \\ 1 \\ -2 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} -15 \\ 4 \\ -4 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} 11 \\ 1 \\ 6 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} -6 & -15 & 11 \\ 1 & 4 & 1 \\ -2 & -4 & 6 \end{bmatrix}}.$$

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 6.

MatRep 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

6

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 1 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} 1 & 2 & 0 \\ -1 & -2 & 1 \\ 0 & 1 & -1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & -1 & 2 \\ 0 & 1 & 1 \\ 0 & 1 & 2 \end{bmatrix}.$$

Suppose $f : \mathbb{R}^3 \to \mathbb{R}^3$ is a homomorphism defined by $f(\mathbf{v}) = A\mathbf{v}$ for all $\mathbf{v} \in \mathbb{R}^3$ and $\mathcal{B}$ is a basis of $\mathbb{R}^3$ composed of the columns of B. Find $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10

Solution.

Let $\mathbf{v}_j$ be the j-th column of B. Then $f(\mathbf{v}_j)$'s can be computed as

$$A\mathbf{v}_1 = \begin{bmatrix} 1 \\ -1 \\ 0 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} 4 \\ -2 \\ -1 \end{bmatrix}$$

and $\text{Rep}_{\mathcal{B}}(f(\mathbf{v}_j))$'s are

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} -3 \\ -2 \\ 1 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -1 \\ -3 \\ 1 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} -3 & 1 & -1 \\ -2 & 0 & -3 \\ 1 & 0 & 1 \end{bmatrix}}.$$

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 4.

MatRep 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

Let

$$A = \begin{bmatrix} -1 & -2 & 1 \\ -2 & 0 & -1 \\ -2 & 0 & -2 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & -2 & -2 \\ 2 & -3 & -4 \\ -4 & 7 & 9 \end{bmatrix}.$$

Suppose $f : \mathbb{R}^3 \to \mathbb{R}^3$ is a homomorphism defined by $f(\mathbf{v}) = A\mathbf{v}$ for all $\mathbf{v} \in \mathbb{R}^3$ and $\mathcal{B}$ is a basis of $\mathbb{R}^3$ composed of the columns of B. Find $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10

Solution.

Let $\mathbf{v}_j$ be the j-th column of B. Then $f(\mathbf{v}_j)$'s can be computed as

$$A\mathbf{v}_1 = \begin{bmatrix} -9 \\ 2 \\ 6 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} 15 \\ -3 \\ -10 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} 19 \\ -5 \\ -14 \end{bmatrix}$$

and $\text{Rep}_{\mathcal{B}}(f(\mathbf{v}_j))$'s are

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 11 \\ 20 \\ -10 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} -17 \\ -33 \\ 17 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -29 \\ -43 \\ 19 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 11 & -17 & -29 \\ 20 & -33 & -43 \\ -10 & 17 & 19 \end{bmatrix}}.$$

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 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

5

Let

$$A = \begin{bmatrix} -1 & 2 & -2 \\ 1 & -2 & -1 \\ 2 & -1 & 1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 1 & -2 \\ -4 & -1 & 3 \end{bmatrix}.$$

Suppose $f : \mathbb{R}^3 \to \mathbb{R}^3$ is a homomorphism defined by $f(\mathbf{v}) = A\mathbf{v}$ for all $\mathbf{v} \in \mathbb{R}^3$ and $\mathcal{B}$ is a basis of $\mathbb{R}^3$ composed of the columns of B. Find $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10

Solution.

Let $\mathbf{v}_j$ be the j-th column of B. Then $f(\mathbf{v}_j)$'s can be computed as

$$A\mathbf{v}_1 = \begin{bmatrix} 11 \\ 1 \\ -4 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} 4 \\ -1 \\ -2 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} -10 \\ 1 \\ 5 \end{bmatrix}$$

and $\text{Rep}_{\mathcal{B}}(f(\mathbf{v}_j))$'s are

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 11 \\ 17 \\ 19 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 4 \\ 1 \\ 5 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -10 \\ -7 \\ -14 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 11 & 4 & -10 \\ 17 & 1 & -7 \\ 19 & 5 & -14 \end{bmatrix}}.$$

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 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

6

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 1 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} 0 & -1 & -2 \\ 2 & -2 & 0 \\ 2 & -2 & 0 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & -2 & -1 \\ 0 & 1 & 1 \\ 1 & -4 & -2 \end{bmatrix}.$$

Suppose $f : \mathbb{R}^3 \to \mathbb{R}^3$ is a homomorphism defined by $f(\mathbf{v}) = A\mathbf{v}$ for all $\mathbf{v} \in \mathbb{R}^3$ and $\mathcal{B}$ is a basis of $\mathbb{R}^3$ composed of the columns of B. Find $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10

Solution.

Let $\mathbf{v}_j$ be the j-th column of B. Then $f(\mathbf{v}_j)$'s can be computed as

$$A\mathbf{v}_1 = \begin{bmatrix} -2 \\ 2 \\ 2 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} 7 \\ -6 \\ -6 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} 3 \\ -4 \\ -4 \end{bmatrix}$$

and $\text{Rep}_{\mathcal{B}}(f(\mathbf{v}_j))$'s are

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} -6 \\ -6 \\ 8 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 20 \\ 19 \\ -25 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} 10 \\ 11 \\ -15 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} -6 & 20 & 10 \\ -6 & 19 & 11 \\ 8 & -25 & -15 \end{bmatrix}}.$$

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 6.

MatRep 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

6

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 1 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} 0 & 0 & 0 \\ -1 & 2 & 2 \\ 1 & -2 & 0 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & -1 & 2 \\ -2 & 3 & -2 \\ 0 & 1 & 3 \end{bmatrix}.$$

Suppose $f : \mathbb{R}^3 \to \mathbb{R}^3$ is a homomorphism defined by $f(\mathbf{v}) = A\mathbf{v}$ for all $\mathbf{v} \in \mathbb{R}^3$ and $\mathcal{B}$ is a basis of $\mathbb{R}^3$ composed of the columns of B. Find $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10

Solution.

Let $\mathbf{v}_j$ be the j-th column of B. Then $f(\mathbf{v}_j)$'s can be computed as

$$A\mathbf{v}_1 = \begin{bmatrix} 0 \\ -5 \\ 5 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} 0 \\ 9 \\ -7 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} 0 \\ 0 \\ 6 \end{bmatrix}$$

and $\text{Rep}_{\mathcal{B}}(f(\mathbf{v}_j))$'s are

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} -45 \\ -25 \\ 10 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 73 \\ 41 \\ -16 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -24 \\ -12 \\ 6 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} -45 & 73 & -24 \\ -25 & 41 & -12 \\ 10 & -16 & 6 \end{bmatrix}}.$$

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 8.

MatRep 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

8