姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 2 MATH 104: Linear Algebra II

Let

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

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

$$A\mathbf{v}_1 = \begin{bmatrix} -5 \\ 1 \\ 5 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} 8 \\ -2 \\ -7 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} -3 \\ 2 \\ 0 \end{bmatrix}$$

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

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 31 \\ 22 \\ 8 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} -45 \\ -32 \\ -11 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} 4 \\ 3 \\ -1 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 31 & -45 & 4 \\ 22 & -32 & 3 \\ 8 & -11 & -1 \end{bmatrix}}.$$

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

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

9

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 2 MATH 104: Linear Algebra II

Let

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

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

$$A\mathbf{v}_1 = \begin{bmatrix} -8 \\ -1 \\ 0 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} -18 \\ -3 \\ 2 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} 4 \\ 0 \\ 1 \end{bmatrix}$$

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

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 26 \\ -9 \\ 16 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 66 \\ -23 \\ 38 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -9 \\ 3 \\ -7 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 26 & 66 & -9 \\ -9 & -23 & 3 \\ 16 & 38 & -7 \end{bmatrix}}.$$

Check code = (sum of all entries of $\text{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 1.

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

1

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 2 MATH 104: Linear Algebra II

Let

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

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 $\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

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

$$A\mathbf{v}_1 = \begin{bmatrix} -7 \\ -5 \\ 3 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} -3 \\ -3 \\ 3 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} 10 \\ 6 \\ -2 \end{bmatrix}$$

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

$$\mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 7 \\ -14 \\ 1 \end{bmatrix}, \mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 9 \\ -12 \\ 3 \end{bmatrix}, \text{ and } \mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -2 \\ 12 \\ 2 \end{bmatrix}.$$

Thus,

$$\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 7 & 9 & -2 \\ -14 & -12 & 12 \\ 1 & 3 & 2 \end{bmatrix}}.$$

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

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

6

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 2 MATH 104: Linear Algebra II

Let

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

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

$$A\mathbf{v}_1 = \begin{bmatrix} -1 \\ 0 \\ 0 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} -6 \\ -1 \\ -6 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} 6 \\ 1 \\ 10 \end{bmatrix}$$

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

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} -7 \\ 3 \\ 2 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} -24 \\ 9 \\ 8 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} 8 \\ -1 \\ -4 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} -7 & -24 & 8 \\ 3 & 9 & -1 \\ 2 & 8 & -4 \end{bmatrix}}.$$

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

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

4

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 2 MATH 104: Linear Algebra II

Let

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

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

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

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

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 9 \\ -9 \\ -7 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 8 \\ -12 \\ -8 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} 0 \\ 5 \\ 2 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 9 & 8 & 0 \\ -9 & -12 & 5 \\ -7 & -8 & 2 \end{bmatrix}}.$$

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

8

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 2 MATH 104: Linear Algebra II

Let

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

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 $\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

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

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

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

$$\mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 6 \\ -2 \\ 3 \end{bmatrix}, \mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 11 \\ -3 \\ 6 \end{bmatrix}, \text{ and } \mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -3 \\ 1 \\ -2 \end{bmatrix}.$$

Thus,

$$\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 6 & 11 & -3 \\ -2 & -3 & 1 \\ 3 & 6 & -2 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 7.

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

7

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 2 MATH 104: Linear Algebra II

Let

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

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

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

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

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 12 \\ -8 \\ -5 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 18 \\ -12 \\ -8 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -4 \\ 2 \\ 0 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 12 & 18 & -4 \\ -8 & -12 & 2 \\ -5 & -8 & 0 \end{bmatrix}}.$$

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

MatRep 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

5

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 2 MATH 104: Linear Algebra II

Let

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

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 $\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f)$.

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

$$A\mathbf{v}_1 = \begin{bmatrix} 1 \\ -6 \\ -5 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} 2 \\ -9 \\ -7 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} 0 \\ 7 \\ 7 \end{bmatrix}$$

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

$$\mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 8 \\ -7 \\ 0 \end{bmatrix}, \mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} 13 \\ -11 \\ 0 \end{bmatrix}, \text{ and } \mathrm{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -7 \\ 7 \\ 0 \end{bmatrix}.$$

Thus,

$$\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 8 & 13 & -7 \\ -7 & -11 & 7 \\ 0 & 0 & 0 \end{bmatrix}}.$$

Check code = (sum of all entries of $\mathrm{Rep}_{\mathcal{B},\mathcal{B}}(f)$) mod 10 = 3.

MatRep 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

3

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 2 MATH 104: Linear Algebra II

Let

$$A = \begin{bmatrix} 1 & 2 & 0 \\ 0 & -1 & -1 \\ -2 & 0 & 2 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 2 & -2 \\ 2 & 5 & -4 \\ -2 & -6 & 5 \end{bmatrix}.$$

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

$$A\mathbf{v}_1 = \begin{bmatrix} 5 \\ 0 \\ -6 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} 12 \\ 1 \\ -16 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} -10 \\ -1 \\ 14 \end{bmatrix}$$

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

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} -7 \\ -10 \\ -16 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} -18 \\ -23 \\ -38 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} 16 \\ 19 \\ 32 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} -7 & -18 & 16 \\ -10 & -23 & 19 \\ -16 & -38 & 32 \end{bmatrix}}.$$

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

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

5

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 2 MATH 104: Linear Algebra II

Let

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

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

$$A\mathbf{v}_1 = \begin{bmatrix} -2 \\ 7 \\ -2 \end{bmatrix}, A\mathbf{v}_2 = \begin{bmatrix} -2 \\ -1 \\ 1 \end{bmatrix}, \text{ and } A\mathbf{v}_3 = \begin{bmatrix} -3 \\ -4 \\ 3 \end{bmatrix}$$

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

$$\text{Rep}_{\mathcal{B}}(A\mathbf{v}_1) = \begin{bmatrix} 7 \\ -15 \\ 12 \end{bmatrix}, \text{Rep}_{\mathcal{B}}(A\mathbf{v}_2) = \begin{bmatrix} -1 \\ 3 \\ -1 \end{bmatrix}, \text{ and } \text{Rep}_{\mathcal{B}}(A\mathbf{v}_3) = \begin{bmatrix} -4 \\ 9 \\ -5 \end{bmatrix}.$$

Thus,

$$\text{Rep}_{\mathcal{B},\mathcal{B}}(f) = \boxed{\begin{bmatrix} 7 & -1 & -4 \\ -15 & 3 & 9 \\ 12 & -1 & -5 \end{bmatrix}}.$$

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

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

5