姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} -4 & 0 & 0 \\ 20 & 2 & -1 \\ -12 & 2 & 5 \end{bmatrix}.$$

Suppose the eigenvalues of A are $\lambda_1, \ldots, \lambda_3$. Find the value of $S = \sum_{i=1}^{3} |\lambda_i|$, where $|\cdot|$ is the absolute value.

Check code = S mod 10

Solution.

The characteristic polynomial of A is

$$x^3 - 3x^2 - 16x + 48$$

and the eigenvalues are

$$\{4, 3, -4\}.$$

Therefore, $S = \boxed{11}$.

Check code = S mod 10 = 1.

AbsSumEigs 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

1

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} 5 & -10 & -20 \\ 0 & 15 & 20 \\ 0 & -10 & -15 \end{bmatrix}.$$

Suppose the eigenvalues of A are $\lambda_1, \ldots, \lambda_3$. Find the value of $S = \sum_{i=1}^{3} |\lambda_i|$, where $|\cdot|$ is the absolute value.

Check code = S mod 10

Solution.

The characteristic polynomial of A is

$$x^3 - 5x^2 - 25x + 125$$

and the eigenvalues are

$$\{-5, 5, 5\}.$$

Therefore, $S = \boxed{15}$.

Check code = S mod 10 = 5.

AbsSumEigs 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

5

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} -11 & -12 & 24 \\ 18 & 25 & -54 \\ 5 & 8 & -18 \end{bmatrix}.$$

Suppose the eigenvalues of A are $\lambda_1, \ldots, \lambda_3$. Find the value of $S = \sum_{i=1}^{3} |\lambda_i|$, where $|\cdot|$ is the absolute value.

Check code = S mod 10

Solution.

The characteristic polynomial of A is

$$x^3 + 4x^2 + x - 6$$

and the eigenvalues are

$$\{1, -2, -3\}.$$

Therefore, $S = \boxed{6}$.

Check code = S 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 3 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} 5 & -10 & 8 \\ 4 & -8 & 4 \\ -3 & 4 & -6 \end{bmatrix}.$$

Suppose the eigenvalues of A are $\lambda_1, \ldots, \lambda_3$. Find the value of $S = \sum_{i=1}^{3} |\lambda_i|$, where $|\cdot|$ is the absolute value.

Check code = S mod 10

Solution.

The characteristic polynomial of A is

$$x^3 + 9x^2 + 26x + 24$$

and the eigenvalues are

$$\{-2, -3, -4\}.$$

Therefore, $S = \boxed{9}$.

Check code = S mod 10 = 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

9

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} -6 & -9 & -18 \\ 4 & 7 & 8 \\ 2 & 2 & 7 \end{bmatrix}.$$

Suppose the eigenvalues of A are $\lambda_1, \ldots, \lambda_3$. Find the value of $S = \sum_{i=1}^{3} |\lambda_i|$, where $|\cdot|$ is the absolute value.

Check code = S mod 10

Solution.

The characteristic polynomial of A is

$$x^3 - 8x^2 + 21x - 18$$

and the eigenvalues are

$$\{2, 3, 3\}.$$

Therefore, $S = \boxed{8}$.

Check code = S mod 10 = 8.

AbsSumEigs 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 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} 6 & 1 & 7 \\ 1 & 2 & 1 \\ -1 & -3 & -2 \end{bmatrix}.$$

Suppose the eigenvalues of A are $\lambda_1, \ldots, \lambda_3$. Find the value of $S = \sum_{i=1}^{3} |\lambda_i|$, where $|\cdot|$ is the absolute value.

Check code = S mod 10

Solution.

The characteristic polynomial of A is

$$x^3 - 6x^2 + 5x + 12$$

and the eigenvalues are

$$\{4, 3, -1\}.$$

Therefore, $S = \boxed{8}$.

Check code = S mod 10 = 8.

AbsSumEigs 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

8

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} -10 & 0 & 12 \\ -16 & -4 & 28 \\ -8 & 0 & 10 \end{bmatrix}.$$

Suppose the eigenvalues of A are $\lambda_1, \ldots, \lambda_3$. Find the value of $S = \sum_{i=1}^{3} |\lambda_i|$, where $|\cdot|$ is the absolute value.

Check code = S mod 10

Solution.

The characteristic polynomial of A is

$$x^3 + 4x^2 - 4x - 16$$

and the eigenvalues are

$$\{2, -2, -4\}.$$

Therefore, $S = \boxed{8}$.

Check code = S mod 10 = 8.

AbsSumEigs 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

8

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} -16 & 42 & 48 \\ -6 & 17 & 24 \\ -1 & 2 & -3 \end{bmatrix}.$$

Suppose the eigenvalues of A are $\lambda_1, \ldots, \lambda_3$. Find the value of $S = \sum_{i=1}^{3} |\lambda_i|$, where $|\cdot|$ is the absolute value.

Check code = S mod 10

Solution.

The characteristic polynomial of A is

$$x^3 + 2x^2 - 23x - 60$$

and the eigenvalues are

$$\{5, -3, -4\}.$$

Therefore, $S = \boxed{12}$.

Check code = S mod 10 = 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

2

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} -13 & 30 & 24 \\ -6 & 14 & 12 \\ 4 & -10 & -8 \end{bmatrix}.$$

Suppose the eigenvalues of A are $\lambda_1, \ldots, \lambda_3$. Find the value of $S = \sum_{i=1}^{3} |\lambda_i|$, where $|\cdot|$ is the absolute value.

Check code = S mod 10

Solution.

The characteristic polynomial of A is

$$x^3 + 7x^2 + 14x + 8$$

and the eigenvalues are

$$\{-1, -2, -4\}.$$

Therefore, $S = \boxed{7}$.

Check code = S mod 10 = 7.

AbsSumEigs 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

7

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3 MATH 104 / GEAI 1209: Linear Algebra II

Let

$$A = \begin{bmatrix} -7 & -12 & -12 \\ 0 & 1 & 0 \\ 4 & 6 & 7 \end{bmatrix}.$$

Suppose the eigenvalues of A are $\lambda_1, \ldots, \lambda_3$. Find the value of $S = \sum_{i=1}^{3} |\lambda_i|$, where $|\cdot|$ is the absolute value.

Check code = S mod 10

Solution.

The characteristic polynomial of A is

$$x^3 - x^2 - x + 1$$

and the eigenvalues are

$$\{-1, 1, 1\}.$$

Therefore, $S = \boxed{3}$.

Check code = S mod 10 = 3.

AbsSumEigs 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

3