姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 3 MATH 104: Linear Algebra II

Let

$$A = \begin{bmatrix} -11 & 5 & -16 \\ 0 & -4 & 0 \\ 8 & -7 & 13 \end{bmatrix}.$$

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

Check code $= S \bmod 10$

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 $= S \bmod 10 = 2$.

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

2

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 3 MATH 104: Linear Algebra II

Let

$$A = \begin{bmatrix} -3 & -1 & 0 \\ 2 & -6 & 0 \\ -1 & 1 & -4 \end{bmatrix}.$$

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

$$x^3 + 13x^2 + 56x + 80$$

and the eigenvalues are

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

Therefore, $S = \boxed{13}$.

Check code = S mod 10 = 3.

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

3

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 3 MATH 104: Linear Algebra II

Let

$$A = \begin{bmatrix} 30 & 4 & 56 \\ 30 & 7 & 63 \\ -16 & -2 & -30 \end{bmatrix}.$$

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 $= S \bmod 10$

Solution.

The characteristic polynomial of A is

$$x^3 - 7x^2 + 2x + 40$$

and the eigenvalues are

$$\{5, 4, -2\}.$$

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

Check code $= S \bmod 10 = 1$.

AbsSumEigs 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 104: Linear Algebra II

Let

$$A = \begin{bmatrix} -10 & -6 & 6 \\ 18 & 11 & -12 \\ 10 & 7 & -8 \end{bmatrix}.$$

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 $= S \bmod 10$

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 $= S \bmod 10 = 7$.

AbsSumEigs 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 104: Linear Algebra II

Let

$$A = \begin{bmatrix} -9 & -8 & 6 \\ 22 & 21 & -18 \\ 8 & 8 & -7 \end{bmatrix}.$$

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 $= S \bmod 10$

Solution.

The characteristic polynomial of A is

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

and the eigenvalues are

$$\{5, 1, -1\}.$$

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

Check code $= S \bmod 10 = 7$.

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

7

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 3 MATH 104: Linear Algebra II

Let

$$A = \begin{bmatrix} -39 & 70 & 98 \\ -20 & 36 & 47 \\ -2 & 4 & 7 \end{bmatrix}.$$

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

$$x^3 - 4x^2 - 17x + 60$$

and the eigenvalues are

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

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

Check code = S mod 10 = 2.

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

2

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 3 MATH 104: Linear Algebra II

Let

$$A = \begin{bmatrix} 5 & -36 & 66 \\ 4 & -31 & 58 \\ 2 & -14 & 26 \end{bmatrix}.$$

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

$$x^3 - 7x + 6$$

and the eigenvalues are

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

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

Check code = S mod 10 = 6.

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

6

姓名 Name : ____________________ 學號 Student ID # : ____________________

Let

$$A = \begin{bmatrix} -29 & 38 & 48 \\ -15 & 20 & 24 \\ -6 & 8 & 10 \end{bmatrix}.$$

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 $= S \bmod 10$

Solution.

The characteristic polynomial of A is

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

and the eigenvalues are

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

Therefore, $S = \boxed{5}$.

Check code $= S \bmod 10 = 5$.

AbsSumEigs 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

5

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 3 MATH 104: Linear Algebra II

Let

$$A = \begin{bmatrix} -9 & 2 & 26 \\ -8 & 5 & 16 \\ -4 & 0 & 13 \end{bmatrix}.$$

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 $= S \bmod 10$

Solution.

The characteristic polynomial of A is

$$x^3 - 9x^2 + 23x - 15$$

and the eigenvalues are

$$\{5, 3, 1\}.$$

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

Check code $= S \bmod 10 = 9$.

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

9

姓名 Name : ____________________ 學號 Student ID # : ____________________

Quiz 3 MATH 104: Linear Algebra II

Let

$$A = \begin{bmatrix} 25 & 60 & -60 \\ -13 & -31 & 33 \\ -3 & -6 & 8 \end{bmatrix}.$$

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

$$x^3 - 2x^2 - 25x + 50$$

and the eigenvalues are

$$\{5, 2, -5\}.$$

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

Check code = S mod 10 = 2.

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

2