姓名 Name : _____ 學號 Student ID # : _____

Quiz 1 MATH 203: Discrete Mathematics I

Consider the equation

$$x_1 + \cdots + x_4 \leq 9$$

under the conditions

$$x_1 \geq 0, x_2 \geq 0, x_3 \geq 1, x_4 \geq 0.$$

Count the number of the integer solutions.

Check code = (sum of all digits of your answer) mod 10

Solution.

The equivalent equation is

$$y_1 + \cdots + y_5 = 8,$$

where

$$y_1 = x_1, y_2 = x_2, y_3 = x_3 - 1, y_4 = x_4.$$

Therefore, the answer is

$$\binom{5+8-1}{8} = \boxed{495}.$$

Check code = (sum of all digits of your answer) mod 10 = 8.

CountIntSol 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

8

姓名 Name : _____ 學號 Student ID # : _____

Quiz 1 MATH 203: Discrete Mathematics I

Consider the equation

$$x_1 + \cdots + x_3 \leq 4$$

under the conditions

$$x_1 \geq 0, x_2 \geq 1, x_3 \geq 0.$$

Count the number of the integer solutions.

Check code = (sum of all digits of your answer) mod 10

Solution.

The equivalent equation is

$$y_1 + \cdots + y_4 = 3,$$

where

$$y_1 = x_1, y_2 = x_2 - 1, y_3 = x_3.$$

Therefore, the answer is

$$\binom{4+3-1}{3} = \boxed{20}.$$

Check code = (sum of all digits of your answer) mod 10 = 2.

CountIntSol 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 1 MATH 203: Discrete Mathematics I

Consider the equation

$$x_1 + \cdots + x_4 \leq 7$$

under the conditions

$$x_1 \geq 0, x_2 \geq 0, x_3 \geq 1, x_4 \geq 1.$$

Count the number of the integer solutions.

Check code = (sum of all digits of your answer) mod 10

Solution.

The equivalent equation is

$$y_1 + \cdots + y_5 = 5,$$

where

$$y_1 = x_1, y_2 = x_2, y_3 = x_3 - 1, y_4 = x_4 - 1.$$

Therefore, the answer is

$$\binom{5+5-1}{5} = \boxed{126}.$$

Check code = (sum of all digits of your answer) mod 10 = 9.

CountIntSol 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

9

姓名 Name : _____ 學號 Student ID # : _____

Quiz 1 MATH 203: Discrete Mathematics I

Consider the equation

$$x_1 + \cdots + x_3 = 7$$

under the conditions

$$x_1 \geq 0, x_2 \geq 1, x_3 \geq 1.$$

Count the number of the integer solutions.

Check code = (sum of all digits of your answer) mod 10

Solution.

The equivalent equation is

$$y_1 + \cdots + y_3 = 5,$$

where

$$y_1 = x_1, y_2 = x_2 - 1, y_3 = x_3 - 1.$$

Therefore, the answer is

$$\binom{3+5-1}{5} = \boxed{21}.$$

Check code = (sum of all digits of your answer) mod 10 = 3.

CountIntSol 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

3

姓名 Name : _____ 學號 Student ID # : _____

Quiz 1 MATH 203: Discrete Mathematics I

Consider the equation

$$x_1 + \cdots + x_5 = 7$$

under the conditions

$$x_1 \geq 1, x_2 \geq 0, x_3 \geq 1, x_4 \geq 0, x_5 \geq 0.$$

Count the number of the integer solutions.

Check code = (sum of all digits of your answer) mod 10

Solution.

The equivalent equation is

$$y_1 + \cdots + y_5 = 5,$$

where

$$y_1 = x_1 - 1, y_2 = x_2, y_3 = x_3 - 1, y_4 = x_4, y_5 = x_5.$$

Therefore, the answer is

$$\binom{5+5-1}{5} = \boxed{126}.$$

Check code = (sum of all digits of your answer) mod 10 = 9.

CountIntSol 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

9

姓名 Name : _____ 學號 Student ID # : _____

Quiz 1 MATH 203: Discrete Mathematics I

Consider the equation

$$x_1 + \cdots + x_5 \leq 4$$

under the conditions

$$x_1 \geq 1, x_2 \geq 1, x_3 \geq 0, x_4 \geq 0, x_5 \geq 0.$$

Count the number of the integer solutions.

Check code = (sum of all digits of your answer) mod 10

Solution.

The equivalent equation is

$$y_1 + \cdots + y_6 = 2,$$

where

$$y_1 = x_1 - 1, y_2 = x_2 - 1, y_3 = x_3, y_4 = x_4, y_5 = x_5.$$

Therefore, the answer is

$$\binom{6+2-1}{2} = \boxed{21}.$$

Check code = (sum of all digits of your answer) mod 10 = 3.

CountIntSol 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

3

姓名 Name : _____ 學號 Student ID # : _____

Quiz 1 MATH 203: Discrete Mathematics I

Consider the equation

$$x_1 + \cdots + x_4 \leq 5$$

under the conditions

$$x_1 \geq 1, x_2 \geq 0, x_3 \geq 0, x_4 \geq 0.$$

Count the number of the integer solutions.

Check code = (sum of all digits of your answer) mod 10

Solution.

The equivalent equation is

$$y_1 + \cdots + y_5 = 4,$$

where

$$y_1 = x_1 - 1, y_2 = x_2, y_3 = x_3, y_4 = x_4.$$

Therefore, the answer is

$$\binom{5+4-1}{4} = \boxed{70}.$$

Check code = (sum of all digits of your answer) mod 10 = 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

7

姓名 Name : _____ 學號 Student ID # : _____

Quiz 1 MATH 203: Discrete Mathematics I

Consider the equation

$$x_1 + \cdots + x_3 = 8$$

under the conditions

$$x_1 \geq 1, x_2 \geq 0, x_3 \geq 0.$$

Count the number of the integer solutions.

Check code = (sum of all digits of your answer) mod 10

Solution.

The equivalent equation is

$$y_1 + \cdots + y_3 = 7,$$

where

$$y_1 = x_1 - 1, y_2 = x_2, y_3 = x_3.$$

Therefore, the answer is

$$\binom{3+7-1}{7} = \boxed{36}.$$

Check code = (sum of all digits of your answer) mod 10 = 9.

CountIntSol 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

9

姓名 Name : _____ 學號 Student ID # : _____

Quiz 1 MATH 203: Discrete Mathematics I

Consider the equation

$$x_1 + \cdots + x_4 \leq 8$$

under the conditions

$$x_1 \geq 1, x_2 \geq 0, x_3 \geq 0, x_4 \geq 0.$$

Count the number of the integer solutions.

Check code = (sum of all digits of your answer) mod 10

Solution.

The equivalent equation is

$$y_1 + \cdots + y_5 = 7,$$

where

$$y_1 = x_1 - 1, y_2 = x_2, y_3 = x_3, y_4 = x_4.$$

Therefore, the answer is

$$\binom{5+7-1}{7} = \boxed{330}.$$

Check code = (sum of all digits of your answer) 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 203: Discrete Mathematics I

Consider the equation

$$x_1 + \cdots + x_4 = 5$$

under the conditions

$$x_1 \geq 0, x_2 \geq 1, x_3 \geq 1, x_4 \geq 0.$$

Count the number of the integer solutions.

Check code = (sum of all digits of your answer) mod 10

Solution.

The equivalent equation is

$$y_1 + \cdots + y_4 = 3,$$

where

$$y_1 = x_1, y_2 = x_2 - 1, y_3 = x_3 - 1, y_4 = x_4.$$

Therefore, the answer is

$$\binom{4+3-1}{3} = \boxed{20}.$$

Check code = (sum of all digits of your answer) mod 10 = 2.

CountIntSol 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