

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3

MATH 203: Discrete Mathematics I

Solve the recurrence relation

$$a_n = (-5)a_{n-1} + (-4)a_{n-2} \text{ for } n \geq 2,$$

$$a_0 = 3, a_1 = 15.$$

Write your solution in the form of

$$a_n = c_1 \cdot r_1^n + c_2 \cdot r_2^n.$$

Check code = $(c_1 + c_2 + r_1 + r_2) \bmod 10$

Solution.

Solve the characteristic polynomial

$$x^2 = (-5)x + (-4)$$

and get

$$r_1 = -4, r_2 = -1.$$

Then solve the system of linear equations

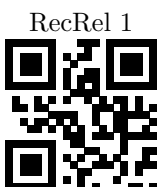
$$a_0 = c_1 + c_2 = 3$$

$$a_1 = (-4)c_1 + (-1)c_2 = 15$$

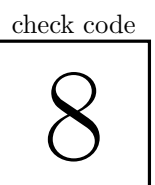
to get

$$c_1 = -6, c_2 = 9.$$

Check code = $(c_1 + c_2 + r_1 + r_2) \bmod 10 = 8$.



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



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Quiz 3

MATH 203: Discrete Mathematics I

Solve the recurrence relation

$$a_n = (-2)a_{n-1} + (8)a_{n-2} \text{ for } n \geq 2,$$

$$a_0 = -17, a_1 = 20.$$

Write your solution in the form of

$$a_n = c_1 \cdot r_1^n + c_2 \cdot r_2^n.$$

Check code = $(c_1 + c_2 + r_1 + r_2) \bmod 10$

Solution.

Solve the characteristic polynomial

$$x^2 = (-2)x + (8)$$

and get

$$r_1 = -4, r_2 = 2.$$

Then solve the system of linear equations

$$a_0 = c_1 + c_2 = -17$$

$$a_1 = (-4)c_1 + (2)c_2 = 20$$

to get

$$c_1 = -9, c_2 = -8.$$

Check code = $(c_1 + c_2 + r_1 + r_2) \bmod 10 = 1.$



RecRel 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

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Quiz 3

MATH 203: Discrete Mathematics I

Solve the recurrence relation

$$a_n = (2)a_{n-1} + (15)a_{n-2} \text{ for } n \geq 2,$$

$$a_0 = 6, a_1 = -42.$$

Write your solution in the form of

$$a_n = c_1 \cdot r_1^n + c_2 \cdot r_2^n.$$

$$\text{Check code} = (c_1 + c_2 + r_1 + r_2) \bmod 10$$

Solution.

Solve the characteristic polynomial

$$x^2 = (2)x + (15)$$

and get

$$r_1 = 5, r_2 = -3.$$

Then solve the system of linear equations

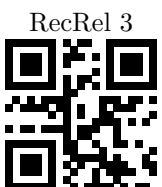
$$a_0 = c_1 + c_2 = 6$$

$$a_1 = (5)c_1 + (-3)c_2 = -42$$

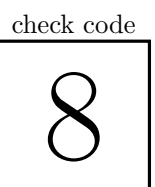
to get

$$c_1 = -3, c_2 = 9.$$

$$\text{Check code} = (c_1 + c_2 + r_1 + r_2) \bmod 10 = 8.$$



Indicating your answer by **underlining it** or **circling it**.
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Quiz 3

MATH 203: Discrete Mathematics I

Solve the recurrence relation

$$a_n = (-1)a_{n-1} + (12)a_{n-2} \text{ for } n \geq 2,$$

$$a_0 = -4, a_1 = 9.$$

Write your solution in the form of

$$a_n = c_1 \cdot r_1^n + c_2 \cdot r_2^n.$$

Check code = $(c_1 + c_2 + r_1 + r_2) \bmod 10$

Solution.

Solve the characteristic polynomial

$$x^2 = (-1)x + (12)$$

and get

$$r_1 = -4, r_2 = 3.$$

Then solve the system of linear equations

$$a_0 = c_1 + c_2 = -4$$

$$a_1 = (-4)c_1 + (3)c_2 = 9$$

to get

$$c_1 = -3, c_2 = -1.$$

Check code = $(c_1 + c_2 + r_1 + r_2) \bmod 10 = 5$.



RecRel 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 3 MATH 203: Discrete Mathematics I

Solve the recurrence relation

$$a_n = (7)a_{n-1} + (-10)a_{n-2} \text{ for } n \geq 2,$$

$$a_0 = 8, a_1 = 10.$$

Write your solution in the form of

$$a_n = c_1 \cdot r_1^n + c_2 \cdot r_2^n.$$

$$\text{Check code} = (c_1 + c_2 + r_1 + r_2) \bmod 10$$

Solution.

Solve the characteristic polynomial

$$x^2 = (7)x + (-10)$$

and get

$$r_1 = 2, r_2 = 5.$$

Then solve the system of linear equations

$$a_0 = c_1 + c_2 = 8$$

$$a_1 = (2)c_1 + (5)c_2 = 10$$

to get

$$c_1 = 10, c_2 = -2.$$

$$\text{Check code} = (c_1 + c_2 + r_1 + r_2) \bmod 10 = 5.$$



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

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Quiz 3

MATH 203: Discrete Mathematics I

Solve the recurrence relation

$$a_n = (3)a_{n-1} + (4)a_{n-2} \text{ for } n \geq 2,$$

$$a_0 = 1, a_1 = 44.$$

Write your solution in the form of

$$a_n = c_1 \cdot r_1^n + c_2 \cdot r_2^n.$$

$$\text{Check code} = (c_1 + c_2 + r_1 + r_2) \bmod 10$$

Solution.

Solve the characteristic polynomial

$$x^2 = (3)x + (4)$$

and get

$$r_1 = 4, r_2 = -1.$$

Then solve the system of linear equations

$$a_0 = c_1 + c_2 = 1$$

$$a_1 = (4)c_1 + (-1)c_2 = 44$$

to get

$$c_1 = 9, c_2 = -8.$$

$$\text{Check code} = (c_1 + c_2 + r_1 + r_2) \bmod 10 = 4.$$



RecRel 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

姓名 Name : _____ 學號 Student ID # : _____
Quiz 3 MATH 203: Discrete Mathematics I

Solve the recurrence relation

$$a_n = (-2)a_{n-1} + (15)a_{n-2} \text{ for } n \geq 2,$$

$$a_0 = -5, a_1 = 33.$$

Write your solution in the form of

$$a_n = c_1 \cdot r_1^n + c_2 \cdot r_2^n.$$

$$\text{Check code} = (c_1 + c_2 + r_1 + r_2) \bmod 10$$

Solution.

Solve the characteristic polynomial

$$x^2 = (-2)x + (15)$$

and get

$$r_1 = 3, r_2 = -5.$$

Then solve the system of linear equations

$$a_0 = c_1 + c_2 = -5$$

$$a_1 = (3)c_1 + (-5)c_2 = 33$$

to get

$$c_1 = 1, c_2 = -6.$$

$$\text{Check code} = (c_1 + c_2 + r_1 + r_2) \bmod 10 = 3.$$



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

check code
3

姓名 Name : _____ 學號 Student ID # : _____

Quiz 3

MATH 203: Discrete Mathematics I

Solve the recurrence relation

$$a_n = (0)a_{n-1} + (9)a_{n-2} \text{ for } n \geq 2,$$

$$a_0 = -1, a_1 = -15.$$

Write your solution in the form of

$$a_n = c_1 \cdot r_1^n + c_2 \cdot r_2^n.$$

Check code = $(c_1 + c_2 + r_1 + r_2) \bmod 10$

Solution.

Solve the characteristic polynomial

$$x^2 = (0)x + (9)$$

and get

$$r_1 = 3, r_2 = -3.$$

Then solve the system of linear equations

$$a_0 = c_1 + c_2 = -1$$

$$a_1 = (3)c_1 + (-3)c_2 = -15$$

to get

$$c_1 = -3, c_2 = 2.$$

Check code = $(c_1 + c_2 + r_1 + r_2) \bmod 10 = 9.$



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

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Quiz 3

MATH 203: Discrete Mathematics I

Solve the recurrence relation

$$a_n = (1)a_{n-1} + (2)a_{n-2} \text{ for } n \geq 2,$$

$$a_0 = 15, a_1 = 0.$$

Write your solution in the form of

$$a_n = c_1 \cdot r_1^n + c_2 \cdot r_2^n.$$

Check code = $(c_1 + c_2 + r_1 + r_2) \bmod 10$

Solution.

Solve the characteristic polynomial

$$x^2 = (1)x + (2)$$

and get

$$r_1 = 2, r_2 = -1.$$

Then solve the system of linear equations

$$a_0 = c_1 + c_2 = 15$$

$$a_1 = (2)c_1 + (-1)c_2 = 0$$

to get

$$c_1 = 5, c_2 = 10.$$

Check code = $(c_1 + c_2 + r_1 + r_2) \bmod 10 = 6.$



RecRel 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

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Quiz 3 MATH 203: Discrete Mathematics I

Solve the recurrence relation

$$a_n = (7)a_{n-1} + (-12)a_{n-2} \text{ for } n \geq 2,$$

$$a_0 = 0, a_1 = -9.$$

Write your solution in the form of

$$a_n = c_1 \cdot r_1^n + c_2 \cdot r_2^n.$$

$$\text{Check code} = (c_1 + c_2 + r_1 + r_2) \bmod 10$$

Solution.

Solve the characteristic polynomial

$$x^2 = (7)x + (-12)$$

and get

$$r_1 = 3, r_2 = 4.$$

Then solve the system of linear equations

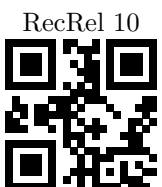
$$a_0 = c_1 + c_2 = 0$$

$$a_1 = (3)c_1 + (4)c_2 = -9$$

to get

$$c_1 = 9, c_2 = -9.$$

$$\text{Check code} = (c_1 + c_2 + r_1 + r_2) \bmod 10 = 7.$$



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