Course is completed. The course result can no longer be changed.

Fibonacci Recurrence Relation

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Quiz

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Now, it's time for a short quiz to recap what you've learned. The quiz is **graded**, so you can take it only once. Each question will be followed by feedback explaining why your answer is right or wrong. If your answer is incorrect, you will see a suggestion of what you might need to refresh your memory.

Good luck!

Read the question below and select the correct answer. Then, click "Submit."

What is the order of a Fibonacci recurrence relation?

- 0
- 1
- 2 ✓
- 3
- 4

Correct: Excellent!

Submit You have used 1 of 1 attempt

Read the question below and select the correct answer. Then, click "Submit."

Which of the following is the correct Fibonacci recurrence relation property for $k > 2$?

- $\sum_{i=1}^{k} f_i^2 = f_k^2$
- $\sum_{i=1}^{k} f_i^2 = f_k + f_{k+1}$
- $\sum_{i=1}^{k} f_i^2 = f_k^2 + f_{k+1}$
- $\sum_{i=1}^{k} f_i^2 = f_k \cdot f_{k+1}$ ✓

Correct: Great job!

Submit You have used 1 of 1 attempt

Read the question below and select the correct answer. Then, click "Submit."

What is the solution to the Fibonacci recurrence relation below?

$$a_k = a_{k-1} + a_{k-2},\ a_1 = 1,\ a_2 = 1$$

- $\frac{1}{\sqrt{5}}\left(\frac{1+\sqrt{5}}{2}\right)^{n+1} + \frac{1}{\sqrt{5}}\left(\frac{1-\sqrt{5}}{2}\right)^{n+1}$

$a_n = \left(\frac{1+\sqrt{5}}{2\sqrt{5}}\right) \cdot \left(\frac{1+\sqrt{5}}{2}\right)^n + \left(\frac{\sqrt{5}+1}{2\sqrt{5}}\right) \cdot \left(\frac{1-\sqrt{5}}{2}\right)^n$

$a_n = \left(\frac{1+\sqrt{5}}{2\sqrt{5}}\right) \cdot \left(\frac{1+\sqrt{5}}{2}\right)^n + \left(\frac{\sqrt{5}-1}{2\sqrt{5}}\right) \cdot \left(\frac{1-\sqrt{5}}{2}\right)^n$

$a_n = \left(\frac{1+\sqrt{5}}{2\sqrt{5}}\right) \cdot \left(\frac{1+\sqrt{5}}{2}\right)^{n-1} + \left(\frac{\sqrt{5}-1}{2\sqrt{5}}\right) \cdot \left(\frac{1-\sqrt{5}}{2}\right)^{n-1}$

Well done!

The solutions to the Fibonacci characteristic equation $x^2 - x - 1 = 0$ are $x_1 = \frac{1+\sqrt{5}}{2}$, $x_2 = \frac{1-\sqrt{5}}{2}$

Correct: The coefficients are equal to: $\frac{1+\sqrt{5}}{2\sqrt{5}}$, $\frac{\sqrt{5}-1}{2\sqrt{5}}$, respectively.

Submit You have used 1 of 1 attempt

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