QUIZ (5%)

HARMONIC SERIES

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Question 1

What mathematical function appears repeatedly in the series?

$$f(x) = c_0 + c_1 \sin(x + \alpha_1) + c_2 \sin(2x + \alpha_2) + c_3 \sin(3x + \alpha_3) + \ldots$$

- Cosine
- Sine
- Tangent
- Logarithm

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Question 2

Given a standard form Fourier series representation by harmonic series

$$f(x) = c_0 + c_1 \sin(x + \alpha_1) + c_2 \sin(2x + \alpha_2) + c_3 \sin(3x + \alpha_3) + \ldots$$

Choose the correct answer.

$c_0 = \frac{b_0}{2}$

$a_0 = \frac{1}{12}\sum_{r=1}^{12} f(x_r)$

$c_n = \sqrt{a_n + b_n}$

$a_0 = \frac{1}{6}\sum_{r=1}^{12} f(x_r)$

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Question 3

What is the period of the function f(x)?

π

$\frac{\pi}{2}$

2π

4π

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Question 4

In which quadrant is the angle

$$A = \alpha = \tan^{-1}\frac{a_1}{b_1}$$

when both $a_1 > 0$ and $b_1 > 0$?

- 1st Quadrant
- 3rd Quadrant
- 2nd Quadrant
- 4th Quadrant

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Question 5

What is used to help determine the correct angle A in each case?

- Radius
- Slope
- Reference angle
- Frequency

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