Warm-Ups 05

ⓘ This is a preview of the published version of the quiz

Started: Mar 4 at 12:55pm

Quiz Instructions

Question 1 2 pts

Assume you could be sure of getting a 4% annual return forever on money you invest now; in other words, every dollar invested now will grow to 1.04^k dollars k years from now.

You'd like to set up an annuity that will pay you $10,000 every year, forever, starting a year from now. Which of the following expresses the minimum amount you would need to invest now? In other words, what is the sum of all of these annual $10,000 payouts, after converting each one to the equivalent value today?

- $\sum_{k=1}^{\infty} 10000 \cdot (1.04)^k$

- $\sum_{k=1}^{\infty} \frac{10000}{(1.04)^k}$

- $20,000

- Impossible. Even with 4% annual growth, no annuity can provide that much value indefinitely.

Question 2 2 pts

Use the formula for the sum of a geometric series (Theorem 14.1.1) to evaluate the sum in the previous problem. What is the required investment? Careful: the formula in Theorem 14.1.1 starts at i=0, but our sum starts at k=1.

- $240,000

- ○ $250,000
- ○ $260,000
- ○ $20,000

Question 3 3 pts

Let $f : \mathbb{R}^+ \to \mathbb{R}^+$, and define the sum $s = \sum_{k=1}^{n} f(k)$ and the integral $i = \int_1^n f(x)\,dx$.

If f is weakly increasing, what lower and upper bounds do we get for s from the integral method?

[Select] $\leq s \leq$ [Select]

If f is weakly decreasing, what lower and upper bounds do we get for s from the integral method?

[Select] $\leq s \leq$ [Select]

Question 4 3 pts

Let $s = \sum_{n=1}^{57} \frac{1}{\sqrt[3]{n+7}}$. Given that $\int_1^{57} \frac{1}{\sqrt[3]{x+7}}\,dx = 18$, what lower and upper bounds does the integral method provide on the sum s?

Lower bound: [Select]

Upper bound: [Select]

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