

Quiz 9 will cover the following material: (all handouts posted on the web site so far)

1. All material for Quizzes 1-8 and Exam 1
2. State the axioms of real numbers.
3. Proving statements about sequences using $\varepsilon - N$ proofs.

Sample Quiz 9

1. Let R be the region defined by $y = \cos x$ and $y = 0$ between $-\frac{\pi}{2}$ and $\frac{\pi}{2}$.
 - a) Find the volume of the object we obtain when rotating R to the line $y = -2$.
 - b) Find the volume of the object we obtain when rotating R to the line $x = -2$.
 - c) Find the center of mass of R using a uniform density δ .
2. Prove that if a sequence is convergent, then it is bounded.
3. Let $a_n = \frac{3n - 5}{n + 2}$
 - a) Find $\lim_{n \rightarrow \infty} a_n$
 - b) Find a value of N that works with $\varepsilon = 0.02$
 - c) Find a value of N that works with $\varepsilon = 0.0001$
 - d) Find a general expression for N in terms of ε .

Answers

1. Let R be the region defined by $y = \cos x$ and $y = 0$ between $-\frac{\pi}{2}$ and $\frac{\pi}{2}$.
 - a) $8\pi + \frac{1}{2}\pi^2$ b) 8π c) $(0, \frac{\pi}{8})$
2. see handout
3. a) 3 b) answers may vary, and any value $N \geq 548$ is correct
 c) answers may vary, and any value $N \geq 10998$ is correct
 d) answers may vary, but $\lceil \frac{11}{\varepsilon} - 2 \rceil$ or $\lceil \frac{11}{\varepsilon} \rceil$ or any greater integer are correct