

Hello. Please write DNE in a blank if the described object does not exist or if the indicated operation cannot be performed.

C1: Show no work.

Z15 Prof. King believes that writing in complete, coherent sentences is crucial in communicating Mathematics, improves posture, and whitens teeth. **Circle** one:

True! Yes! wH'at S a?sEnTENcE

a Repeating decimal $.41\overline{02}$ equals $\frac{n}{d}$, where posints $n \perp d$ are $n=$ and $d=$

b25 A map $L: \mathbf{V} \times \mathbf{E} \rightarrow \mathbf{W}$ (where $\mathbf{V}, \mathbf{E}, \mathbf{W}$ are \mathbb{R} -VSes) is **bilinear** if [QFN]

An **inner product** $\langle \cdot, \cdot \rangle$ is a map $\mathbf{V} \times \mathbf{V} \rightarrow \mathbb{R}$ st. [QFN]

I1:

I2:

I3:

c $MS(X, d)$ is **totally-disconnected** IFF (Defn.)

d Let $\mathbf{v} := (2, -1, 2, 2, 2, 2) \in \mathbb{R}^6$; so $\|\mathbf{v}\|_4 =$

e Let $f: \mathbb{R} \rightarrow \mathbb{R}$ by $f(x) := [x+1]^2 - 3$. Define restrictions $g := f|_{[-5,2]}$ and $h := f|_{[0,1]}$. Then the sup-norm $\|g\|_{\text{sup}} =$ and $\|h\|_{\text{sup}} =$

f Using the stereographic-metric on \mathbb{R} :

$\sigma(-1, 0) =$, $\sigma(\infty, 0) =$. For $u \in \mathbb{R}_+$, distance $\sigma(-u, u) =$ = Formula(u).

Essay question: Carefully write a triple-spaced essay solving the problem.

C2: We have seqs $\vec{x}, \vec{y} \subset \mathbb{R}$ with $\lim(\vec{x}) = 2$ and $\lim(\vec{y}) = 4$. Letting $p_n := x_n \cdot y_n$, give a rigorous ε -proof that $\lim(\vec{p}) = 8$.

(Do **not** restate the problem. You may quote, without proof, this theorem: If \vec{b} convergent, then $\text{Diam}(\text{Range}(\vec{b})) < \infty$.)

End of Class-C

C1: 140pts

C2: 85pts

Poorly stapled, or missing ordinal : -5pts

Missing name, or honor sig : -5pts

Total: 225pts

Please PRINT your **name** and **ordinal**. Ta:

Ord:

HONOR CODE: "I have neither requested nor received help on this exam other than from my professor."

Signature: