

Advanced Discrete Mathematics

Problem Solving 7

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Q: In the setting of quantum groups, I see the $q \rightarrow 1$ specialisation a lot, but not much of the $q \rightarrow 0$ specialisation (like that in degenerating the q -analogue of the integers); what's up with that?

A: In fact, there are three worlds:

Classical	Quantum	Crystals
Lie algebra $\mathfrak{g}$ and its universal enveloping algebra $U(\mathfrak{g})$	Quantum group $U_q(\mathfrak{g})$	Kashiwara operators
$q=1$	$q=0$	

Q: Can you define metrics or topologies on a poset?

A: Yes! The simplest way to do this is to use the distance metric induced from the Hasse diagram.

Otherwise, another way to do this is the following.
Let $(P, \leq)$ be a poset and

$$B = \{P_{\leq a} \mid a \in P\} \quad \text{where} \quad P_{\leq a} = \{z \in P \mid z \leq a\}$$

The poset topology is the topology generated by B .