Information

These questions are about proper use of relevant terminology, mainly about relations.

Question **4**

Answer saved

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Here is a definition of R that we'll use on the rest of this pages. Fix it.

(Do it in both languages, no matter which study programme you're on. This may involve external sources about mathematical terminology or musicology. Don't worry about Danish grammar – the token "bamse" stands for both "en bamse", "bamsen" and "bamser.")

Definition: Let S be the set of symphonies and C the [set] of all composers. For instance, S contains the [element] *Jupiter Symphony* and C includes the [subset] {Beethoven, Britney Spears} Define the [relation] R as the set of [tuples] (s, c) from the [Cartesian product] $S \times C$ for which s was written by c.

Definition: Lad S angive mængden af symfonier og C [mængde] af alle komponister. For eksempel er *Jupitersymfonien* et [element] i S og {Beethoven, Britney Spears} er [delmængde] af C. Definér [relation] R som mængden af [tupel] (s, c) fra [kartesiske produkt] $S \times C$ for hvilke s blev skrevet af c.

Nitpickers: We make reasonable assumptions about what a symphony is, for concreteness you can take the List of symphonies with names on Wikipedia. Similarly, a composer is a single human, living or dead, who would be identified as the originator of a piece of music by an average musical scholar. Britney Spears is a composer, "creativity of the human spirit" or "Eru Ilúvatar" are not.

Question 5

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Which properties does relation R have?

- [ ] a. R is a total relation
- [x] b. $R = S \times C$
- [ ] c. R is a function from S to C.
- [ ] d. R is a total order
- [ ] e. R is an injective function (one-to-one)
- [ ] f. R is a bijective function
- [x] g. R is a binary relation
- [ ] h. R is reflexive
- [ ] i. R is symmetric
- [ ] j. R is a surjective function (R maps onto C)
- [x] k. R is transitive
- [x] l. $R = \emptyset$
- [ ] m. R is a partial order

Question 6

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Let $c \in C$ be a composer, write sRc for $(s, c) \in R$ and define $w(c) = \{ s \in S : sRc \}$.

Which claims about $w(c)$ are true?

- [ ] a. It makes no sense.
- [ ] b. It is $O(1)$
- [x] c. It can be $\emptyset$
- [ ] d. It is a symphony
- [ ] e. It is a powerset
- [x] f. It is a subset of symphonies
- [ ] g. It is a binary relation

Question 7

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I want to express that symphony s was written by composer c. How could I express that using common terminology or notation?

- [ ] a. cRs
- [x] b. "s is related to c under R"
- [ ] c. $(s, c) \subseteq R$
- [ ] d. $(s, c) \in R$
- [ ] e. $\{s, c\} \cup R \neq \emptyset$
- [ ] f. $\{s, c\} \subseteq R$
- [ ] g. $(s \in R) \wedge (c \in R)$
- [x] h. sRc