# Exercício 6

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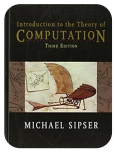

Introduction to the Theory of Computation

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**Solução** Certificado

**Passo 1** 1 de 2

Let's have languages $A$, $B$ and $C$ and two reductions $f_{AB}$ and $f_{BC}$ such that $A \leq_m B$ and $B \leq_m C$. Then we claim that $A \leq_m C$ with the reduction being $f = f_{BC} \circ f_{AB}$.

Now let's take a string $s \in A$ and take a look at $f(s)$:

$$f(s) = f_{BC}(f_{AB}(s)) = f_{BC}(s_1) = s_2, \ for\ some\ s_1 \in B, s_2 \in C$$

On the other hand, if we take a string $w \notin A$, we get:

$$f(s) = f_{BC}(f_{AB}(w)) = f_{BC}(w_1) = w_2, \ for\ some\ w_1 \notin B, w_2 \notin C$$

Now we can see that $f$ is a mapping from $A$ to $C$ so we have $A \leq_m C$.

Therefore, $\leq_m$ is a transitive relation.

**Resultado** 2 de 2

Take three sets $A, B$ and $C$ for which $A \leq_m B$ and $B \leq_m C$.

Using their reductions, construct a reduction from $A$ to $C$.

‹ Exercício 5

Avaliar esta solução

Exercício 7 ›