

Answer on Question #42825, Math, Other

**Problem.** Let  $L$  be a language given by  $L = \{a^n b^n : n \geq 0\}$ , then  $L^2$  is equal to

- a)  $\{a^n b^n a^m b^m : n \geq 0, m \geq 0\}$
- b)  $\{a^n b^n : n \geq 0\}$
- c)  $\{a^n b^n a^n b^n : n \geq 0\}$
- d) none of these.

**Solution.**

If  $L_1$  and  $L_2$  are languages over some common alphabet, then concatenation  $L_1 L_2$  consists of all strings of the form  $vw$  where  $v$  is a string from  $L_1$  and  $w$  is a string from  $L_2$ .

The language  $L^2$  consists of all string  $a^n b^n a^m b^m$ , where  $n \geq 0$  and  $m \geq 0$ .

**Answer:** a)  $\{a^n b^n a^m b^m : n \geq 0, m \geq 0\}$