

**book problems**

§6.1 # 1, 3, 7, 12

§6.2 # 1, 4

§7.2 #1, 4, 8, 13

**Non-book problem:** (Computer problem) Find the least value of  $N$  such that  $M(N) = 10^k$  for  $k = 1, 2, 3, 4, \dots$  (as far out as you can get your computer to go). What does Merten's conjecture say about the upper order of  $M(N)$ ? Can you find a value of  $N$  for which  $M(N) > \sqrt{N}^\diamond$ ?

**Extra credit problem:** Let  $x = \sqrt{2}$ ,  $y = \sqrt{2} + 2$ . For  $z \in \mathbb{R}$ , let  $[z]$  denote the greatest integer less than or equal to  $z$ .

For all positive integers  $n$ , prove that  $A = \{[nx] \mid n > 0\}$  and  $B = \{[ny] \mid n > 0\}$  partition the set of positive integers, i.e.,  $A$  and  $B$  don't intersect and their union is  $\mathbb{Z}^+$ .

$\diamond$  automatic A+ in the course if you can find such an  $N$