

Math 310 Assignment 8

PROBLEMS: 7.1, 7.2, 7.17(a)(b), 7.20, 7.24, 7.28(a), 7.30(a)(b)

The problems above are DUE FRIDAY, Dec. 7th at lecture or during office hours.

HOMEWORK NOTES/HINTS

- PROBLEM 7.28: Don't use your calculator or long division to check the divisibility (I am giving you this problem to practice modular arithmetic). Write $535801 = 5 \cdot 10^5 + 3 \cdot 10^4 + 5 \cdot 10^3 + 8 \cdot 10^2 + 0 \cdot 10 + 1$. Then simplify each of the 10 's modulo 7 . Here are a few ways that the first powers of 10 could be simplified:
 $10 \equiv 3 \pmod{7}$
 $10^2 \equiv 3^2 \equiv 9 \equiv 2 \pmod{7}$
 $10^3 \equiv 10 \cdot 10^2 \equiv 3 \cdot 2 \equiv 6 \equiv -1 \pmod{7}$
and so forth. Then simplify each term and add up. You are trying to see if the number is congruence to zero or not. Once again, this problem is merely here to give you practice with modular arithmetic, so don't use your calculator (you would be cheating yourself). If you practice this, you can get pretty quick.
- PROBLEM 7.30(a): In general you can start by writing $n = a_0 + a_1 10 + a_2 10^2 + \dots + a_r 10^r$. This is the base 10 expansion. Use the same sort of argument that we used in class for divisibility by 9 .
- The following problems are worth extra credit. Some are difficult and some are just review.

CHALLENGE PROBLEMS: 7.9, 7.19, 7.21, 7.23

REVIEW PROBLEMS: 7.8, 7.15, 6.26, 4.31, 3.47