

**Homework 3**

due Wednesday, June 24, at 5:00 pm

Hand in:

From the text:

Section §1.3 #13, 24, 27

13. Prove that the sum of the cubes of any three consecutive positive integers is divisible by 9.
24. Show that the remainder of an integer  $n$  when divided by 9 is the same as the remainder of the sum of its digits when divided by 9.
27. Prove that in any Pythagorean triple  $(a, b, c)$ , either  $a$  or  $b$  is divisible by 3, and one of  $a, b, c$  is divisible by 5.

From the Study Guide: page 13, §1.3 #48, 49, 50, 54, 55

48. Solve the following congruence.  $25x \equiv 45 \pmod{60}$
49. Find the additive orders of each of the following elements, by solving the appropriate congruences.
  - (a) 4, 5, 6 modulo 24
  - (b) 4, 5, 6 modulo 25
50. Find the additive orders of each of the following elements, by solving the appropriate congruences.
  - (a) 7, 8, 9 modulo 24
  - (b) 7, 8, 9 modulo 25
54. Solve the following system of congruences:
$$x \equiv 13 \pmod{25} \quad x \equiv 9 \pmod{18}$$
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