

Quantitative Reasoning 28: The Magic of Numbers

Homework 16

Assigned on March 18

Due at 5:00 p.m. March 21

Please submit problem sets to the boxes outside the Math Department's main office, on the third floor of the Science Center (Room 325).

Reading:

Gross-Harris, Chapters 14 and 15

Problems:

Please explain your reasoning and show your work.

The following questions all relate to arithmetic mod 7. (Modular arithmetic was introduced in today's lecture.)

1. Write down the addition and multiplication tables for arithmetic mod 7. That is, create tables of 7 rows and 7 columns, showing the sum and product of each pair of numbers.
2. In arithmetic mod 7, what is $2-5$? Remember, this is the number that, when added to 5, gives a result of 2.
3. In arithmetic mod 7, what is $2/5$? Remember, this is the number that, when multiplied by 5, gives a result of 2.
4. Is there a square root of 2 in arithmetic mod 7? That is, is there a number that, when multiplied by itself, gives a result of 2?