WARM–UP PROBLEMS

NEW HAMPSHIRE STATE TEAM
NATIONAL MATHCOUNTS PREPARATION

(1) For how many integers is $(x-3)(x+6) < 0$?

(2) If you select an integer randomly between 1 and 200 what is the probability that its reciprocal does not have a terminating decimal expansion?

(3) What is the sum of the first 75 odd numbers? What is the sum of the first 150 even numbers?

(4) What is the maximum number of non–intersecting diagonals that can be drawn in a cube?

(5) You have three green jelly beans and two red jelly beans in a jar. If you take out two jelly beans at random, what is the probability that exactly 1 is red? What is the probability that at most 1 is red?

(6) What day of the week will it be 2017 days from Thursday?

(7) How many positive integers have the same number of digits in base 3 and base 4?

(8) If you roll two 12–sided dice what is the probability that the product is prime or a perfect square?

(9) How many paths are there from $(0,0)$ to $(5,5)$ that don't pass through $(2,2)$?

(10) How many pairs of positive integers (x,y) satisfy $xy - 2x + y - 14 = 0$?