

BGSU Mathematics Competition, March 22 2014 **B**

No cell phones are allowed. Show all work. Explain your answers.

1) Find the sum $S = 2 + 4 + 6 + \dots + 2012 + 2014$.

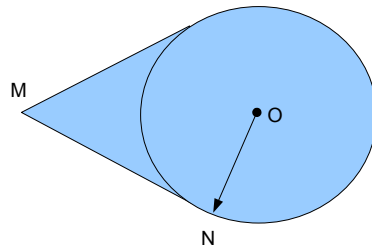
2) A bag contains small straws of the following lengths: 2cm , 3cm , 5cm , 7cm , 11cm and 13cm . Three straws are drawn at random. What is the probability that a triangle can be formed with the straws that are drawn?

3) Let $f(X) = X^2 + 12X + 30$. Find x such that $f(f(f(f(f(x)))))) = 0$.

4) Determine a 3-digit number ABC such that $ABC = A! + B! + C!$.

5) Two days ago I was 28, but next year I'll be 31. When is my birthday? What day is today?

6) Two lines are tangent to a circle of radius $ON = 1\text{cm}$ and intersect at a point a distance $OM = 2\text{cm}$ from the center of the circle as shown below. Determine the area of the shaded region enclosed by the lines and the circle.



Registration 2014 BGSU Mathematics Competition;

Your NAME:

(Optional) Math class you are registered, and name of you instructor: