Math 2326 - Introduction to Abstract Mathematics
Assignment 7 - Due Monday, February 4

In Problems 27 through 29, prove the given statement.

Problem 27:

For all integers $n \geq 3$, if n distinct points on a circle are connected in consecutive order with straight lines, then the sum of the interior angles of the resulting polygon is $(n-2)180°$.

Problem 28:

Let $F_1 = 1$, $F_2 = 1$ and for $n \geq 3$ set

$$F_n = F_{n-1} + F_{n-2},$$

so that $F_3 = 2$, $F_4 = 3$, $F_5 = 5$, $F_6 = 8$, etc. (these are the *Fibonacci numbers*.) For all $n \geq 1$,

$$F_n = \frac{1}{\sqrt{5}} \left(\left(\frac{1 + \sqrt{5}}{2} \right)^n - \left(\frac{1 - \sqrt{5}}{2} \right)^n \right).$$

Problem 29:

Let a be a nonzero real number such that $a + 1/a \in \mathbb{Z}$. For all $n \in \mathbb{N}$, $a^n + 1/a^n \in \mathbb{Z}$.

Problem 30: Bob goes to Double Dave's Pizza for the lunch buffet. There are n different varieties of pizza for Bob to choose from and he decides he will eat at least one slice of pizza, but no more than one from any given variety. If his lunch consists of the different varieties of pizza that he eats, how many different lunches can he have? [*Hint:* Try experimenting with small values of n.]