1. How many zeros are at the end of 1000! ?
2. Find the smallest n such that the nth Fibonacci number is divisible by 30.
3. Compute the units digit of $(2009 \cdot 2011 \cdot 2013)^n$, where n is the answer to this problem.
4. Compute the number formed by the last two digits of $(2009 \cdot 2011 \cdot 2013)^n$, where n is the answer to this problem.
5. Factor the polynomial $x^4 - 16$ into a product of linear polynomials with possibly complex coefficients.
6. The polynomial $P(x)$ has remainder 3 when divided by $x - 1$ and remainder 5 when divided by $x + 1$. What is the remainder when $P(x)$ is divided by $x^2 - 1$?
7. Find the third degree polynomial with integer coefficients and leading coefficient 1, each of whose roots is one more than one of the roots of $x^3 + x^2 + 1$.
8. Jim is trying to construct the angle bisector of $\angle B$ in $\triangle ABC$. While Jim is away, Clio drops some jam on Jim's diagram, covering angle B. Describe the process for Jim's construction given the obstruction.
9. 9 girls and 3 boys sit in one row of a classroom. How many seating arrangements are there, if none of the boys are allowed to sit next to each other?
10. How many nine digit positive integers have the property that the digits do not decrease from left to right?