

Euclidean Algorithm

1. Find the GCD of 27 and 42.
2. Find the GCD of 146 and 224.
3. Prove that $\frac{21n+4}{14n+3}$ cannot be reduced for any n . (*IMO 1959, #1*)
4. Hose A fills the pool in a hours; hose B in b hours. Both a, b are integers. Together it takes 6 hours. How many possible values are there for a ? (*2010 Gauss (Grade 7) #25*)
5. Find all numbers where $2^n + n \mid 8^n + n$ (*Mathcamp Team Problem Solving, #1*)
6. Consider the sequence 100, 101, 104, 109, 116, 125, Now let $\{d_n\}$ be the GCD between consecutive terms. What's the max in $\{d_n\}$? (*1985 AIME #13*)