

Math 55: Homework 6

Due Monday, July 13

1. Use the Extended Euclidean Algorithm to find a solution to $108a + 19b = 1$.
2. An army has between 2000 and 3000 soldiers. When they stand in lines of 108 there are 21 left over. When they stand in lines of 19 there are 16 left over. How many soldiers are in the army?
3. Let $d = \gcd(a, b)$. Use Bezout's Theorem to prove that if $e|a$ and $e|b$ then $e|d$.
4. Let a and b be relatively prime. Prove that if $a|n$ and $b|n$ then $ab|n$. (Hint: if $\gcd(a, b) = 1$ and $a|bc$ then $a|c$)
5. Use the result from the previous question: How can you tell if a number is divisible by 45 without doing long division?