

M E T U

Department of Mathematics

Basic Algebra						
MidTerm I						
Code : <i>Math 116</i>			Last Name :			
Acad. Year : <i>2013-2014</i>			Name :		Student No :	
Semester : <i>Spring</i>			Department :			
Instructor : <i>G.E., T.K., M.K., A.S</i>			Signature :			
Date : <i>01.04.2014</i>			6 Questions on 4 Pages Total 60 Points			
Time : <i>17.40</i>						
Duration : <i>100 minutes</i>						
1	2	3	4	5	6	

1.(10 pts.) Find $d = \gcd(431, 29)$ and find integers a, b such that $d = 431a + 29b$.

2.(10 pts.) Solve the congruence $17x \equiv 5 \pmod{43}$.

3. (10 pts.) Suppose that a, b, c are non-zero integers such that $b|a$ and $c|a$. Let $d = \gcd(b, c)$. Prove that $bc|ad$.

4. (10 pts.) Find the subgroup generated by $[6]$ in the group \mathbb{Z}_{14} under addition.

5. (10 pts.) Let G be a group and $H \subset G$ be a subgroup. Let $C = \{g \in G : gh = hg \text{ for all } h \in H\}$. Show that C is also subgroup of G .

6. (10 pts.) Let G be a group such that for all a in G we have $a^{-1} = a$. Show that G is abelian.