

Math 317 Section B1 Quiz 2

February 1, 2002

**Problem 1.**

Use the Euclidean algorithm to find  $d = \gcd(35, 98)$  and to express  $d$  as a linear combination of 35 and 98. Provide all details of your work.

**Solution.**

Put  $a = 98$ ,  $b = 35$  and perform the Euclidean algorithm:

$$98 = 2 \cdot 35 + 28$$

$$35 = 1 \cdot 28 + 7$$

$$28 = 4 \cdot 7 + 0$$

Hence  $7 = \gcd(98, 35)$ .

Performing back substitutions in the above formulas we obtain:

$$7 = 35 - 1 \cdot 28 = 35 - 1 \cdot (98 - 2 \cdot 35) = 3 \cdot 35 - 1 \cdot 98.$$