
PROBLEM SET

Assignment 2

Math 3310-101, Spring 2015

June 8, 2015

- Write all of your answers on separate sheets of paper. You can keep the question sheet.
- You **must** show enough work to justify your answers. Unless otherwise instructed, give exact answers, not approximations (e.g., $\sqrt{2}$, not 1.414).
- This problem set has 1 problems. There are **100 points total**.

Good luck!

100 pts.

Problem 1. Let a and b be natural numbers. A natural number m is a common multiple of a and b if it is dividable by both a and b . The smallest common multiple is called the **least common multiple of a and b** written $\text{lcm}(a, b)$.

How can you calculate this? You can do it using the greatest common divisor (a, b) .

Theorem 1 *If a and b are natural numbers, the least common multiple is given by*

$$\text{lcm}(a, b) = \frac{ab}{(a, b)}.$$

The assignment is to prove the theorem
Here is a suggestion for one approach.

1. Let ℓ be $ab/(a, b)$. Show that ℓ is a common multiple of a and b , so there are natural numbers x and y such that $\ell = xa = yb$
 2. Show that $(x, y) = 1$.
 3. Show that if c is a common multiple of a and b then ℓ divides c . Explain why this finishes the proof
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