

Math 1: Fundamental Mathematical Concepts I

Assignment 10

Due Wed Nov 16

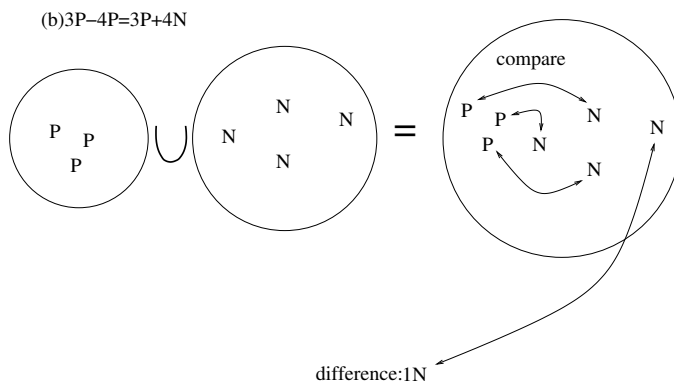
Justify your answers using relevant terms and concepts from the course.

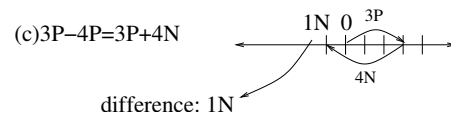
Present each of the following four types of solutions to the integer arithmetic exercises below:

- (a) Using the precise formulas for the integer operations of addition ($x + y = [\bar{x} + \bar{y}]$) and subtraction ($x - y = x + -(y)$),
- (b) Using the precise definition of the integer operation of addition as unioning of sets of 2 types followed by comparison,
- (c) Using the number-line model for the integers,
- (d) Using facts of integer arithmetic given in lecture.

For example, for the problem $3P - 4P$, we have the solutions

$$\begin{aligned}
 (a) \quad 3P - 4P &= 3P + -(4P) \\
 &= 3P + 4N \\
 &= [\overline{3P} + \overline{4N}] \\
 &= [(3, 0) + (0, 4)] \\
 &= [(3, 4)] \\
 &= [3P, 4N] \\
 &= (4 - 3)N \\
 &= 1N
 \end{aligned}$$





$$(d) 3P - 4P = 3 - 4 = -(4 - 3) = -(1) = -1 = 1N$$

Exercises:

1. $3P + 2P$
2. $3P - 2P$
3. $P - 4N$
4. $P - 4P$
5. $2N - 5N$
6. $5N - 2N$