1 Putnam

1. Divide and conquer to understand better, i.e. to check if something is divisible, break it up, $\frac{10+5}{2} = \frac{10}{2}\frac{5}{2}$, now check, if one is fraction and other is not, then sum is integer + fraction.

2 Patterns Of Proofs

2.1 Proof by Contradiction

1. A proof by contracdiction is essentially proving the contrapositive of T $\implies$ P, which is, $\neg P \implies F$, this means if we can prove that $\neg P \implies F$, then P must be true.

2.2 Proofs about Sets

1. Informally, a set is just a collection of objects, which are called elements.
2. A set can contain a set.
3. $\{x, x\} = \{x\}$.

Symbol	Set	Elements
$\varnothing$	empty set	
$\mathbb{N}$	non-negative integers	{0, 1, 2, ...}
$\mathbb{Z}$	integers	{..., -1, 0, 1, ...}
$\mathbb{Q}$	rational numbers	0.5, -9, 33.33, ect
$\mathbb{R}$	real numbers	$\pi, \sqrt{2}, 9.9$, ect.
$\mathbb{C}$	complex numbers	i, 34, ect.

1. $\mathbb{R}^+$ is only positive real numbers.