

Math 112 Group problems, Wednesday Week 1

PROBLEM 1. Compute $\sum_{k=-2}^2(3k+2)$ and show that it equals $3\sum_{k=-2}^2 k + \sum_{k=-2}^2 2$.

PROBLEM 2. Use induction to prove that each $n \geq 1$,

$$1 \cdot 2 + 2 \cdot 3 + \cdots + n \cdot (n+1) = \frac{n(n+1)(n+2)}{3}.$$

PROBLEM 3. Let $a > -1$ be a real number. Use induction to show that for all integers $n \geq 0$,

$$(1+a)^n \geq 1+na.$$

(Note: for any nonzero real number x , we have that $x^0 = 1$, by definition.)