

## QUIZ 1 : MATH 1200- PROBLEMS, CONJECTURES AND PROOFS

OCTOBER 6, 2008

Consider the sum

$$\frac{1}{1 \cdot 2 \cdot 3} + \frac{1}{2 \cdot 3 \cdot 4} + \frac{1}{3 \cdot 4 \cdot 5} + \cdots + \frac{1}{n(n+1)(n+2)}$$

- (1) (1 point) Write the above expression in summation notation.
- (2) (2 points) What is the sum equal to if  $n = 100$ ? (Hint:  $\frac{1}{n(n+1)(n+2)} = \frac{1}{2n} - \frac{1}{n+1} + \frac{1}{2n+4}$ )
- (3) (3 points) A computer account requires a 4 character password using the digits 0-9 and lowercase letters. Explain why there are 1212640 such 4 character passwords which contain at least one letter and at least one digit.