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.