1. For the following questions, please write the answer in the box provided. You DO NOT need to justify your answer but you must do all your rough work on this sheet (backside is okay to use) only.

(a) Let
$$a_n = \frac{b_{n+1}}{b_n}$$
, where $b_1 = 1$, $b_2 = 1$ and $b_{n+2} = b_n + b_{n+1}$. Then



- (b) Let $y_n = \sum_{k=1}^n \frac{1}{k!}$ for $n \in \mathbb{N}$. Then mark TRUE or FALSE in the corresponding boxes next to each statement.
 - (i) y_n converges to $y \in \mathbb{Q}$ as $n \to \infty$.
 - (ii) y_n is a Cauchy Sequence in \mathbb{Q} .

(c) Let $c_n = \begin{cases} 2 + \frac{1}{n} & \text{if } n \text{ is an odd number.} \\ 1 + \frac{1}{2^n} & \text{if } n \text{ is an even number.} \end{cases}$ Then

