

Discussion 6

1. (*cf. Rosen 2.1 Exercise 17*) Suppose that A , B , and C are sets such that $A \subseteq B$ and $B \subseteq C$. Show that $A \subseteq C$.

2. Let $P(n)$ be the statement that

$$1 + \frac{1}{4} + \frac{1}{9} + \cdots + \frac{1}{n^2} < 2 - \frac{1}{n},$$

where n is an integer greater than or equal to 1.

(a) What is the statement $P(1)$? Is it true or false?

(b) What is the statement $P(2)$? Is it true or false?

(d) Express $P(n)$ in terms of summation (Sigma) notation.

(e) Is it true that for all $n > 0$, $P(n)$? Prove or disprove.