Write the general expression, in terms of $x$, for the functions 

\[(x)(f \circ g)(x)\]

and also 

\[(x)(g \circ f)(x)\]

(a) Calculate $g \circ f$ and also $(f \circ g)$.

(b) Is $x$ a subset of the range of $f$? Explain your answer.

(iii) Is one-to-one? Explain your answer.

(iv) The range of $g$ is

\[\left[ \frac{2}{3} \right]

\[1 + \left[ \frac{2}{3} \right] = (4)6 \quad \text{and} \quad 1 + [x] = (2)6 \quad \text{if} \quad \{0 \leq x < 1 \} = x \]}

and \( \{0 \leq x \leq 1 \} = x \leq X \) equal.

10. (6 marks)

(a) How many different ways are there to choose 3 letters all at once from the bag.

(b) There are three vowels in the bag $\{a, e, i\}$. When 3 letters are chosen from the bag of 11 letters, what is the probability that exactly one of the letters is a vowel?

9. (6 marks)

(a) How many different ways are there to choose 3 letters all at once from the bag.

(b) A bag contains 11 distinct letters: A, B, C, D, E, F, G, H, I, J, K.

First Semester Examination, June 2001 (continued)