

**Question 4****(7 marks)**

Functions  $f$ ,  $g$  and  $h$  are defined such that:

$$f(x) = \frac{1}{x-1}, g(x) = x^2, h(x) = \sqrt{x}.$$

(a) Determine the defining rule for  $f(h(x))$ . (1 mark)

(b) Determine the domain for  $f(h(x))$ . (2 marks)

(c) Determine the range for  $f(h(x))$ . (2 marks)

(d) Is it true that  $f(h(g(x))) = \frac{1}{x-1} = f(x)$ ? Justify your answer. (2 marks)