10 f and g are two functions such that

$$f : x \mapsto x^2 + 2x \quad \text{where } x > -1$$

$$g : x \mapsto \frac{13}{x+2}$$

(a) State the value of x that must be excluded from any domain of g

(1)

(b) Find f(3)

(1)

(c) Find the value of x for which $g(x) = 5$

(2)

(d) Find fg(24)

(2)

(e) Find the value of x for which $gf(x) = 4$
Show your working clearly.

(4)

The function h is such that $h : x \mapsto 5x^2 - 10x - 4 \quad \text{where } x \geqslant 1$

(f) Find the inverse of h(x) in the form $h^{-1} : x \mapsto ...$

(4)

[The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$]

Question 10 continued

Question 10 continued

Question 10 continued

(Total for Question 10 is 14 marks)