

9 The functions  $f$  and  $g$  are defined by

$$f(x) = x^2 - 4x + 3 \quad \text{for } x > c, \text{ where } c \text{ is a constant,}$$

$$g(x) = \frac{1}{x+1} \quad \text{for } x > -1.$$

(a) Express  $f(x)$  in the form  $(x - a)^2 + b$ . [2]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

It is given that  $f$  is a one-one function.

(b) State the smallest possible value of  $c$ . [1]

.....

.....

.....

.....

.....

.....

.....

.....

It is now given that  $c = 5$ .

- (c) Find an expression for  $f^{-1}(x)$  and state the domain of  $f^{-1}$ . [3]

This image shows a single sheet of white paper with ten evenly spaced horizontal dotted lines, typical of primary school writing paper. The lines run across the entire width of the page, leaving equal margins at the top and bottom. There are no vertical lines or other markings present.

- (d) Find an expression for  $gf(x)$  and state the range of  $gf$ . [3]

[illegible]