

# Elementary Mathematics 6101

## Exercise Sheet 7

13 October 2010

Please answer all questions on the sheet.

1. Which of the following equations define functions. If they're not, what restriction on the domain will make them functions.

(a)  $f(x) = \frac{2}{x^2-4}$

(b)  $f(x) = mx + c$

(c)  $f(x) = \sqrt{x^2 - 2}$

(d)  $f(x) = (x + 2)^{\frac{1}{3}}$

2. Compute the composition of the following functions:  $f(x) = x^2$ ,  $g(x) = (x - 1)^{-1}$  and  $h(x) = \sqrt{x + 1}$ , compute the following:

(a)  $f \circ g(x)$

(b)  $g \circ f(x)$

(c)  $g \circ h(x)$

(d)  $h \circ f(x)$

3. If  $f \circ h(x) = \sqrt{x + 1}$  and  $f(x) = x + 1$ , what is  $h(x)$ ?

4. Compute the inverses of the following functions:

(a)  $f(x) = x^3 + 1$

(b)  $g(x) = x - 4$

(c)  $h(x) = 1 - \frac{1}{x}$