

Course 2E1 2005-06 (SF Engineers & MSISS & MEMS)**S h e e t 1**

Due: in the tutorial sessions Wednesday/Thursday, 19th/20th of October 2004

Exercise 1

Find the domain and range of the following functions and draw their graphs:

- (i) $f(x) = 1 - x^2$,
- (ii) $f(t) = (t + 1)^3$,
- (iii) $f(x) = \sqrt{1 - x^2}$,
- (iv) $f(x) = 2^{1-x}$,
- (v) $f(t) = \ln(1 - t)$,
- (vi) $f(t) = 2 \sin(2\pi t)$.

Exercise 2

Find the limits:

$$(i) \lim_{x \rightarrow -1} (x^3 - 2^x), \quad (ii) \lim_{x \rightarrow 1} \frac{x^2 - 2x + 1}{x - 1}, \quad (iii) \lim_{x \rightarrow 0^-} e^{\frac{1}{x}}.$$

Exercise 3

Calculate derivatives of the functions in Exercise 1.