

NAME:

## Worksheet Week II

- (a) Sketch the region onto which the sector  $r \leq 2, 0 \leq \theta \leq \pi/3$  is mapped by the transformation

(i)  $w = z + i$

(ii)  $w = z^3$

(iii)  $w = z^3 + i$

(iv)  $w = (-z)^3$

(b) Find the limits using the Theorem in Sec.17

(i)  $\lim_{z \rightarrow \infty} \frac{4z^2}{(z-1)^2}$

(ii)  $\lim_{z \rightarrow 1} \frac{1}{(z-1)^3}$

(c) Where is the following function analytic?

$$H(z) = \frac{3z - 1}{z^3 - 2z^2 + z}.$$