

## **Extreme Problem 6**

The Transformation  $T$  from the  $z$  - plane to the  $w$  - plane is given by

$$w = \frac{1}{z-2}, \quad z \neq 2,$$

where  $z = x + iy$  and  $w = u + iv$

Show that under  $T$  the straight line with equation  $2x + y = 5$  in the  $z$  - plane is transformed into a

circle in the  $w$  - plane centred at  $\left(1, -\frac{1}{2}\right)$  and radius of  $\frac{\sqrt{5}}{2}$  units.