P. 34

P. 61, 62, 65

P 90, 91

P 134 – 140

140 onwards (Chapter 11)

$$\frac{z}{z^2+1} \qquad 0 < |z-i| < 2 \quad \text{around } z_0 = i$$

$$= \frac{z}{(z+i)(z-i)} = \frac{A}{z+i} + \frac{B}{z-i}$$

$$\frac{1}{z+i} = \frac{1}{z+i+1-1}$$

$$= \frac{1}{2i\left(1 + \frac{z-i}{2i}\right)}$$

If f has a simple pole @ z_0, g analytic @ z_0

$$\operatorname{Res}\left(\frac{f}{g}; z_0\right) = \frac{1}{g(z_0)} \operatorname{Res}(f, z_0)$$

$\uparrow$ $g \neq 0$

$$\operatorname{Res}(fg, z_0) = g(z_0) \operatorname{Res}(f; z_0)$$

g has simple zero @ z_0,

$\frac{1}{g}$ has simple pole @ z_0

$$\operatorname{Res}\left(\frac{1}{g}; z_0\right) = \frac{1}{g'(z_0)}$$