

$$2 \left(1 + 5w + 10\bar{w} + 10\bar{w}^2 + 5w^3 + 2 \right)$$

$$2 \left(3 + 5x + 5\bar{w}x + 5\bar{w}^2x \right)$$

$$-2|z|^2 = \frac{\frac{x}{y} + \frac{y}{x} - 1 + |z|^2}{xy} \quad \begin{aligned} x^2 - 3y^2 &= \frac{1+y}{x} \\ 3x^2 - y^2 &= -\frac{x}{y} \end{aligned}$$

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$$x^3 - 3xy^2 + i(3x^2y - y^3) + i(x + iy) = 1$$

$$x^3 - 3xy^2 - y = 1$$

$$3x^2y - y^3 + x = 0$$

$$f(z) = (z-i)Q_1(z) + i \quad f(i) = i$$

$$f(z) = (z+i)Q_2(z) + 1+i \quad f(-i) = 1+i$$

$$f(z) = (z+i)(z-i)Q(z) + az + b$$

$$i = ai + b$$

$$1+ i = -ai + b$$

$$\frac{1}{2} \left| (z_1 + z_2) + \frac{|z_1|z_2}{|z_2|} + \frac{|z_2|z_1}{|z_1|} \right|$$

$$= \frac{1}{2} \left| (z_1 + z_2) + \frac{z_1 \bar{z}_1 z_2 + z_2 \bar{z}_2 z_1}{|z_1| |z_2|} \right|$$

$$= \frac{1}{2} \left| (z_1 + z_2) + \frac{z_1 z_2 (\bar{z}_1 + \bar{z}_2)}{|z_1| |z_2|} \right| \leq \frac{1}{2} \left[|z_1 + z_2| + \frac{|z_1 + z_2|}{2} \right]$$

$$|a_0 z^n + a_1 z^{n-1} + a_2 z^{n-2} + \dots + a_{n-1} z + a_n| = n$$

$$\leq |a_0| |z|^n + |a_1| |z|^{n-1} + |a_2| |z|^{n-2} + \dots + |a_{n-1}| |z| + |a_n|$$

$$\left\{ \begin{array}{l} \text{Case I (near origin)} \\ \text{Case II (} |z| > 1 \text{)} \end{array} \right.$$

Case I $0 < |z| < 1$

$$\frac{1}{1-|z|} > n$$

$\Rightarrow |z| > 1 - \frac{1}{n}$

Case II $|z| > 1$

$|z| > \frac{n-1}{n}$