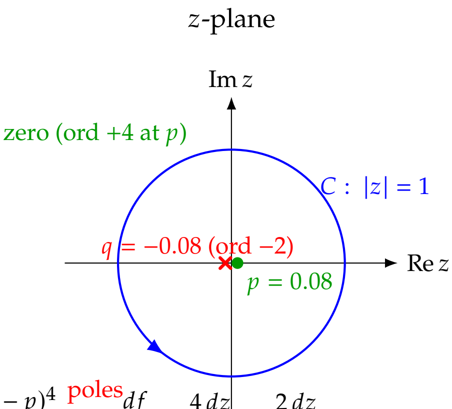

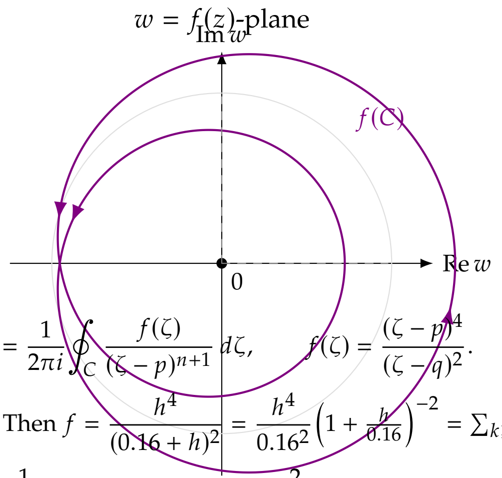

$$a_n = \frac{1}{2\pi i}\oint_C \frac{f(\zeta)}{(\zeta - p)^{n+1}}\,d\zeta, \qquad f(\zeta) = \frac{(\zeta - p)^4}{(\zeta - q)^2}.$$

$$f(z) = \frac{(z-p)^4}{(z-q)^2}, \qquad \frac{df}{f} = \frac{4\,dz}{z-p} - \frac{2\,dz}{z-q}$$

Let $h = \zeta - p$, $p - q = 0.16$. Then $f = \dfrac{h^4}{(0.16+h)^2} = \dfrac{h^4}{0.16^2}\left(1 + \dfrac{h}{0.16}\right)^{-2} = \sum_{k\ge 0}(-1)^k(k+1)\,\dfrac{h^{k+4}}{0.16^{k+2}}$.

$$\operatorname{ord}_p f = \frac{1}{2\pi i}\oint_{\partial D_\varepsilon(p)} \frac{df}{f} = +4, \qquad \operatorname{ord}_q f = \frac{1}{2\pi i}\oint_{\partial D_\varepsilon(q)} \frac{df}{f} = -2.$$

$$\Rightarrow a_0 = a_1 = a_2 = a_3 = 0,\quad a_4 = \frac{1}{0.16^2} = 39.0625,\quad a_5 = -\frac{2}{0.16^3} = -488.28125,\quad a_6 = \frac{3}{0.16^4} = 4577.6367,\ \ldots$$

$\Rightarrow$ #Z − #P = 4 − 2 = 2.

$$\operatorname{wind}\big(f(C), 0\big) = \#Z_C - \#P_C = 4 - 2 = 2 \ \Rightarrow\ \oint_C \frac{f'(z)}{f(z)}\,dz = 2\cdot 2\pi i.$$