Check nullity of perimeter integral

$$\left|\int_{S_N} \frac{\pi \operatorname{cosec} \pi z}{16z^2-1}\,dz\right| \leq \int_{S_N} \left|\frac{\pi \operatorname{cosec} \pi z}{16z^2-1}\right| dz$$

See Note 3

$$\leq \left|\frac{\pi \times 1}{16N^2-1}\right| \times 8N = \frac{\pi}{2N - 1/8N} \left(\to \frac{\pi}{\infty}\right) \to 0.$$

Better to leave this out.

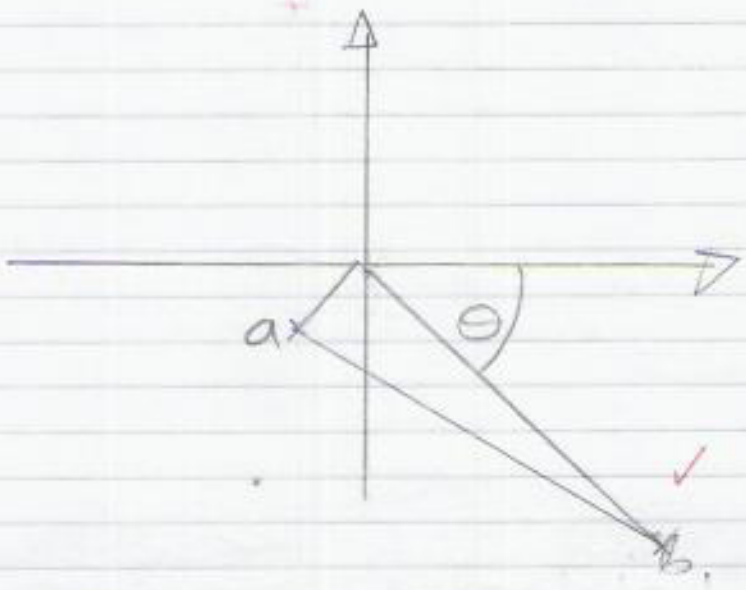
3/4 A,M

$$\therefore \sum_{n=1}^{\infty} \frac{(-1)^n}{16n^2-1} = \frac{-1}{2}\left(-1 + \frac{\pi}{4\sqrt{2}} + \frac{\pi}{4\sqrt{2}}\right)$$

$$= \frac{1}{2} - \frac{\pi}{4\sqrt{2}} \checkmark$$

10/12 1A

(31/33) 2) a)



✓

$$|\gamma(t)| = \sqrt{(2t+1)^2 + (t+2)^2}$$

$$= \sqrt{4t^2+4t+1+t^2+2t+4}$$

$$= \sqrt{5t^2+6t+5}$$

(P.T.O.)

and on the interval $(-\pi, 0)$, $\cos\theta$ is one-one ✓.

$$\gamma(t) = \sqrt{5t^2+6t+5}\,\exp\left(i\cos^{-1}\left(\frac{2t+1}{\sqrt{5t^2+6t+5}}\right)\right)$$

and an argument function is

$$\operatorname{Arg}_{2\pi}(\gamma(t)) = \cos^{-1}\left(\frac{2t+1}{\sqrt{5t^2+6t+5}}\right) \checkmark$$

$$\operatorname{Wind}(\Gamma, 0) = \frac{\operatorname{Arg}(\gamma(1)) - \operatorname{Arg}(\gamma(-1))}{2\pi}$$

$$= \frac{\operatorname{Arg}_{2\pi}(3-3i) - \operatorname{Arg}_{2\pi}(-1-i)}{2\pi}$$