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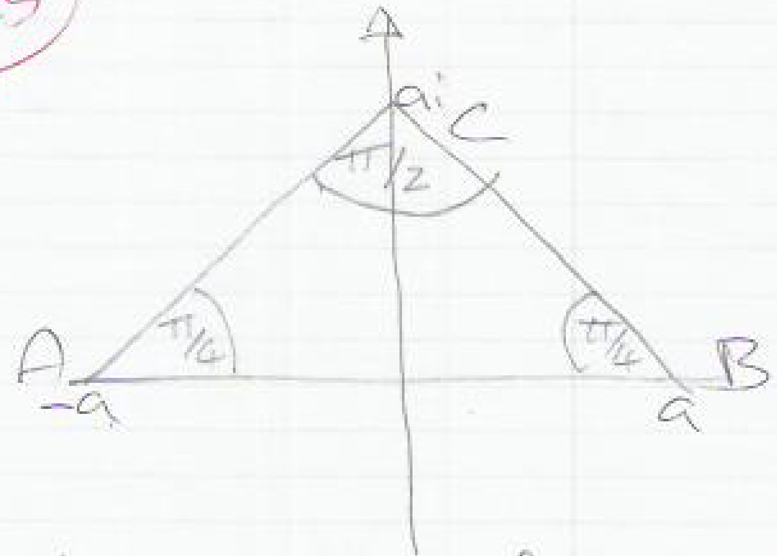

The Schwarz-Christoffel transformation gives

$$\frac{dw}{dz} = A(z+1)^{(\pi/4/\pi - 1)}(z-1)^{(\pi/4/\pi-1)}$$

$$= A(z^2-1)^{-3/4}$$

$$dw = A(z^2-1)^{-3/4}dz \Rightarrow w = A\int_0^z (t^2-1)^{-3/4}dt + B$$

where t is a dummy variable.

$$-a = A\int_0^{-1}(t^2-1)^{-3/4}dt + B \quad ① \text{, boundary conditions}$$

$$a = A\int_0^1 (t^2-1)^{-3/4}dt + B \quad ②$$

$$① + ② \Rightarrow 0 = 2B + A\left(\int_0^{-1}(t^2-1)^{-3/4}dt + \int_0^1 (t^2-1)^{-3/4}dt\right)$$

In 1st integral in brackets we can take t as −ve and integrate between 0 and 1.

then $\int_0^{-1}(t^2-1)^{-3/4}dt = \int_0^1((-t)^2-1)^{-3/4}d(-t)$

$$= -\int_0^1 (t^2-1)^{-3/4}dt$$

Basically ok, but see overleaf

$$0 = 2B + A\left(-\int_0^1 (t^2-1)^{-3/4}dt + \int_0^1 (t^2-1)^{-3/4}dt\right)$$

$$0 = 2B \Rightarrow B = 0$$

P.T.O

then $A = \dfrac{a}{\int_0^1 (t^2-1)^{-3/4}dt} = \dfrac{a}{I}$ ← Not a real integral as you've defined it!

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