take square root, get: $\dfrac{1}{2\pi^{1/2}(\det \Sigma)^{1/2}} = \sqrt{\Sigma K(s)^2}$

$\dfrac{1}{4\pi \det \Sigma}$

$\dfrac{1}{\sqrt{\Sigma K(s)^2}}$

to the power of $^{1/2}$

$\dfrac{\pi \widetilde{\omega}}{\Sigma^{1/2}\pi}$

$\sqrt{2\pi^2}$

so to divide, multiply by $2\pi^{1/2}\det(\Sigma)^{1/2}$

$\Sigma = \sigma^2$

$\dfrac{\pi(\det\Sigma)^{1/2}}{4\pi^2 \det \Sigma} = \dfrac{\pi(\det\Sigma)^{1/2}}{4\pi^2 \det\Sigma}$

$\dfrac{\sqrt{\pi^2 \det(\Sigma)}}{\sqrt{(2\pi)^2 \det(\Sigma)}}^2$

$\sqrt{4\pi \det \Sigma}$

$\left(\dfrac{\sqrt{\pi^2 \det(\Sigma)}}{\sqrt{(2\pi)^n \det(\Sigma)}}\right)^2$ ?

So in 2D $\cdot n = 2$.

$\dfrac{1}{2}\sqrt{\pi} \times \dfrac{1}{\sqrt{\det \Sigma}} \dfrac{\sqrt{(2\pi\sigma^2)^n}}{\sqrt{(2\pi)^2}}^2$

$\dfrac{1}{4}$