

$$\text{ii) } f\left(\frac{1}{2}\pi + i\left(1 - \frac{1}{2}\pi\right)\right) \quad \text{6}$$

$$\begin{aligned} & \cancel{\text{so}} \quad 1 + i\left(\frac{1}{2}\pi + i\left(1 - \frac{1}{2}\pi\right)\right) \\ &= 1 + \frac{\pi i}{2} - \left(1 + \frac{\pi i}{2}\right) = \cancel{\frac{\pi i}{2}} \end{aligned}$$

$$\begin{aligned} f(z) &= \cosh\left(\pi i\cancel{\frac{\pi i}{2}}\right) = \frac{e^{\pi i} + e^{-\pi i}}{2} \\ &= \frac{\cos \pi + i \sin \pi + \cos \pi - i \sin \pi}{2} \\ &= -1. \end{aligned}$$

$$\begin{aligned} g(a) &= \log(\pi i) = \arg(\pi i) + \log \pi \\ &= \frac{\pi i}{2} + \log \pi \end{aligned}$$

$$h(z) = (\pi i)^{\pi i}$$

$$\begin{aligned} \log(h(z)) &= \log((\pi i)^{\pi i}) = \pi i \log \pi i \\ &= \pi i \left(\frac{\pi i}{2} + \log \pi\right) = -\frac{\pi^2}{2} + \pi i \log \pi \end{aligned}$$

$$\begin{aligned} h(z) &= e^{(-\frac{\pi^2}{2} + \pi i \log \pi)} \\ &= e^{-\frac{\pi^2}{2}} e^{\pi i \log \pi} = e^{-\frac{\pi^2}{2}} (e^{\log \pi})^{\pi i} \\ &\text{REWRITE AS } e^{-\frac{\pi^2}{2}} (\cos(\pi \log \pi) + i \sin(\pi \log \pi)) \end{aligned}$$