2.(a)

$\sin(x)$

By Eulers formula : $e^{ix} = \cos(x) + i\sin(x)$

$e^{-ix} = \cos(x) - i\sin(x)$

$\Rightarrow \quad e^{ix} - e^{-ix} = \cancel{\cos(x)} + i\sin(x) - \cancel{\cos(x)} + i\sin(x)$

$e^{ix} - e^{-ix} = 2 \cdot i \cdot \sin(x)$

$\sin(x) = \dfrac{e^{ix} - e^{-ix}}{2 \cdot i}$

Since $\quad \dfrac{1}{i} = \dfrac{1}{i} \cdot \dfrac{i}{i} = \dfrac{i}{-1} = -i$

$\therefore \quad \sin(x) = -i \cdot \left(\dfrac{e^{ix} - e^{-ix}}{2} \right)$

2.b

$\cos(x)$

$e^{ix} + e^{-ix} = \cos(x) + i\cancel{\sin(x)} + \cos(x) - i\cancel{\sin(x)}$

$= 2\cos(x)$

$\therefore \cos(x) = \dfrac{e^{ix} + e^{-ix}}{2}$