KCL V_{c2} : $\frac{V_{c2}}{3j} + \frac{V_{c2}}{-2j} + \frac{V_{c2} - V_1}{4j} = 0.$

$\Rightarrow V_{c2} = 3V_1 = 120j + 3V_{c2}$

$\Rightarrow V_{c2} = -60j = 60\angle -90^\circ$

$v_{c1}(t) = -4\cos(2000t - 90^\circ)$ V.

$v_{c2}(t) = 60\cos(1000t - 90^\circ)$ V

$\Rightarrow v_c(t) = v_{c1} + v_{c2} = -4\cos(2000t - 90^\circ) + 60\cos(1000t - 90^\circ)$ V.