(1) Perform the following with your calculator.

(a) Express your answer in polar form. (5 points)
\[ G = \frac{(6 - j4)(3 + j6)}{(2 - j8)(20 \angle 40^\circ)} = 0.2933 \angle 65.71^\circ \]

(b) Express your answer in rectangular form. (5 points)
\[ G = \frac{(40 \angle 30^\circ)(-9 + j7)}{j10(3 + j9)(-6 + j2)} = -0.6448 - j0.3485 \]

(2) Express the following as phasors.

(a) \( v(t) = 5 \cos(100t - 60^\circ) \) \( V \) (5 points)

(b) \( v(t) = -10 \sin(\omega t + 30^\circ) \) \( V \) (5 points)

(c) \( i(t) = \text{Re}[50e^{(\omega t - 90^\circ)}] \) \( A \) (5 points)

(a) \( v = 5 \angle -60 \) \( V \)

(b) \( v = 10 \cos(\omega t + 120^\circ) \) \( V \)

(c) \( i = 50 \cos(\omega t - 90^\circ) \)
(a) \[ Z = \frac{j40 (20 - j30)}{20 + j10} \]

\[ Z = 64.498 \angle 71.125 \, \Omega \]

(b) \[ 10 \angle j10 = \frac{10 \angle j10 \cdot 10 \angle j10}{10^2 \angle j10} = 5 + j5 \]

\[ 5 + j5 - j10 = 5 - j5 \]

\[ 10 \angle (5 - j5) = \frac{10 (5 - j5)}{15 - j5} = 4 - j2 \]

\[ 10 + 4 - j2 \]

\[ Z = 14 - j2 \, \Omega = 14.14 \angle -8.13^\circ \]