Chris Hunt HW1 ENGR 202

1.1) Given $v(t) = 34\cos(60t + 10°)$ V, Find:

a) $V_m = \boxed{34}$ b) $T = \boxed{\frac{\pi}{30}}$ c) $f = \boxed{\frac{30}{\pi}}$

d) $v(.002s) = 34\cos\left(60(.002) + \frac{10\pi}{180}\right) = \boxed{32.5\ v}$

1.2) Write the Following as cosine Functions:

a) $10\sin(377t + 30°) = \boxed{10\cos(377t - 60°)}$

b) $-2\sin(377t + 45°) = \boxed{10\cos(377t + 135°)}$

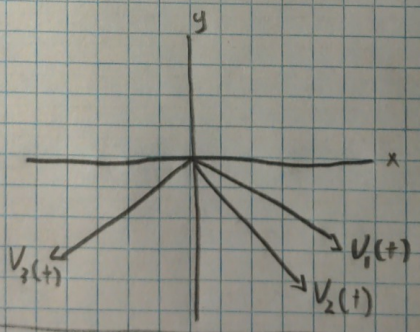
c) $-6\cos(377t - 110°) = \boxed{6\cos(377t + 70°)}$

1.3) Three node-voltages in a network are found to be

$V_1(t) = 6\cos(377t - 20°)\ v \rightarrow 6\angle -20°$

$V_2(t) = 4\sin(377t + 40°)\ v \rightarrow 4\cos(377t - 50) \rightarrow 4\angle -50°$

$V_3(t) = -12\cos(377t + 30°)\ v \rightarrow 12\cos(377t - 150°) \rightarrow 12\angle -150$



$\boxed{V_2 \text{ lags } V_1 \text{ by } 30° \qquad V_3 \text{ lags } V_1 \text{ by } 130°}$

1.4) $\frac{15\angle 45°}{3 + j4} + j3 \rightarrow \frac{15\angle 45°}{5\angle 53.13°} + j3 \rightarrow 3\angle -8.13 + j3 \rightarrow 2.97 - j.424 + j3$

$2.97 + j2.58 \rightarrow \boxed{3.93\angle 40.98}$