Chapter 9, Solution 19.

(a) $3\angle 10° - 5\angle -30° = 2.954 + j0.5209 - 4.33 + j2.5$

$= -1.376 + j3.021$

$= 3.32\angle 114.49°$

Therefore, $3\cos(20t + 10°) - 5\cos(20t - 30°)$

$= \mathbf{3.32\cos(20t + 114.49°)}$

(b) $40\angle -90° + 30\angle -45° = -j40 + 21.21 - j21.21$

$= 21.21 - j61.21$

$= 64.78\angle -70.89°$

Therefore, $40\sin(50t) + 30\cos(50t - 45°) = \mathbf{64.78\cos(50t - 70.89°)}$

(c) Using $\sin\alpha = \cos(\alpha - 90°)$,

$20\angle -90° + 10\angle 60° - 5\angle -110° = -j20 + 5 + j8.66 + 1.7101 + j4.699$

$= 6.7101 - j6.641$

$= 9.44\angle -44.7°$

Therefore, $20\sin(400t) + 10\cos(400t + 60°) - 5\sin(400t - 20°)$

$= \mathbf{9.44\cos(400t - 44.7°)}$