Chapter 9, Solution 6.

(a) $v(t) = 10\cos(4t - 60°)$
$i(t) = 4\sin(4t + 50°) = 4\cos(4t + 50° - 90°) = 4\cos(4t - 40°)$
Thus, **i(t) leads v(t) by 20°**.

(b) $v_1(t) = 4\cos(377t + 10°)$
$v_2(t) = -20\cos(377t) = 20\cos(377t + 180°)$
Thus, **v_2(t) leads v_1(t) by 170°**.

(c) $x(t) = 13\cos(2t) + 5\sin(2t) = 13\cos(2t) + 5\cos(2t - 90°)$
$\mathbf{X} = 13\angle 0° + 5\angle -90° = 13 - j5 = 13.928\angle -21.04°$
$x(t) = 13.928\cos(2t - 21.04°)$
$y(t) = 15\cos(2t - 11.8°)$
phase difference $= -11.8° + 21.04° = 9.24°$
Thus, **y(t) leads x(t) by 9.24°**.