Answer on Question #75382 – Math – Trigonometry

$$\cos x - \cos 3x = \cos x - 4cos^3x - 3\cos x = 4cosx - 4cos^3x = 4cosx(1 - cos^2x) = 4cosx * sin^2$$
$$= 2sinx * 2sinxcosx = 2sinx * sin2x$$

$$\cos x + \cos 3x = 4cos^3x - 2cosx = 2cosx(cos^2x - 1) = 2cosx * \left(-sin^2x\right) = -2cosx * sin^2x$$
$$= -sinx * sin2x$$

$$cos\, x - cos\, 3x - cos2x = cosx - 4cos^3x + 3cosx - cos2x = 4cosx(1 - cos^2x) - cos2x$$
$$= 4cosx * sin^2x - cos2x = 2cosx(1 - cos2x) - cos2x$$
$$= 2cosx - 2cosx * cos2x - cos2x$$

$$\cos x + \cos 3x + cos2x = cosx + 4cos^3x - 3cosx + cos2x = 4cos^3x - 2cosx + cos2x$$
$$= 2cosx(2cos^2x - 1) + cos2x = 2cosx(1 + cos2x - 1) + cos2x$$
$$= 2cosx * cos2x + cos2x = cos2x(2cosx + 1)$$