generalization of the parallelogram law

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Theorem. *In an http://planetmath.org/InnerProductSpaceinner product space, let x, y, z be vectors. Then*

$$\|x + y\|^2 + \|y + z\|^2 + \|z + x\|^2 = \|x\|^2 + \|y\|^2 + \|z\|^2 + \|x + y + z\|^2.$$

Taking $x + z = 0$ we have the usual parallelogram law.