## Handwritten HW 30

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32. Verify the *parallelogram law* for vectors  $\mathbf{u}$  and  $\mathbf{v}$  in  $\mathbb{R}^n$ :

$$||\mathbf{u} + \mathbf{v}||^2 + ||\mathbf{u} - \mathbf{v}||^2 = 2||\mathbf{u}||^2 + 2||\mathbf{v}||^2$$

Solution:

34. Let  $\mathbf{u} = \begin{bmatrix} 5 \\ -6 \\ 7 \end{bmatrix}$ , and let W be the set of all  $\mathbf{x}$  in  $\mathbb{R}^3$  such that  $\mathbf{u} \cdot \mathbf{x} = 0$ .

What theorem in Chapter 4 can be used to show that W is a subspace of  $\mathbb{R}^3$ ? Describe W in geometric language.

Solution: