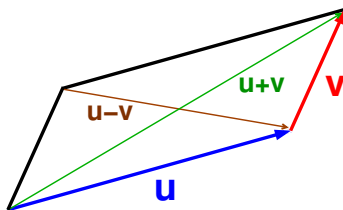


[Submitting HW Tips](#)**HW #1**

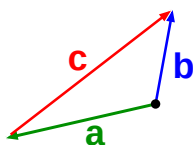
1 Section 1.1 (Page 18): #13, 21.

2 If $\mathbf{u}, \mathbf{v} \in \mathbb{R}^3$, prove the **Parallelogram Law**: $\|\mathbf{u} + \mathbf{v}\|^2 + \|\mathbf{u} - \mathbf{v}\|^2 = 2\|\mathbf{u}\|^2 + 2\|\mathbf{v}\|^2$.



3 Without using the *Law of Cosines*, prove the converse of the Pythagorean Theorem:

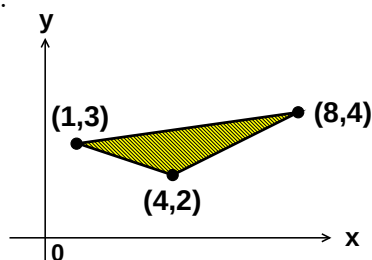
If $\|\mathbf{a}\|^2 + \|\mathbf{b}\|^2 = \|\mathbf{c}\|^2$, prove that $\mathbf{a} \cdot \mathbf{b} = \mathbf{0}$ (i.e., the triangle must be a right triangle).



4 Section 1.2 (Page 29): #20, 26.

5 Section 1.3 (Page 49): #4, 6, 11, 29, 33.

6 Find the area of the triangle shown here:



7 The line through $(3, 2, 1)$ and $(5, 1, 2)$ intersects the plane $x + y + z = 14$ at what point?

8 The plane containing the points $P(1, 1, 1)$, $Q(2, 0, -4)$, and $R(1, 2, 3)$ intersects the x -axis at what point?