## For practice and extra credit only.

1. Use vectors addition to show that
(a) In a regular hexagon $\mathrm{ABCDEF}, \overrightarrow{A B}+\overrightarrow{A C}+\overrightarrow{A E}+\overrightarrow{A F}=2 \overrightarrow{A D}$
(b) In a regular $n$-gon $A_{1} \cdots A_{n}$ with center $O$ and even number of vertices the sum $\sum_{k=1}^{n} O \vec{A}_{k}=0$.
2. Give a definition of

- unit vector;
- dot product of two vectors;
- cross product of two vectors;
- projection of one vector onto another vector.

3. Find the projection of vector $\vec{v}=(2,5,7)$ onto vector $\vec{u}=(-2,1,3)$, and the angle between them.
4. A line goes via points $(1,2,3)$ and $(6,5,4)$. Another line goes through points $(3,2,1)$ and $(4,5,6)$.
(a) Do the two lines intersect? If yes, what is the point of intersection?
(b) Find the distance of each line from the origin.
5. Find equation of a plane which contains points $(1,0,1),(1,2,0),(0,3,1)$.
6. Find area of the quadrilateral with vertices $(-1,-1),(2,0),(3,4),(-3,5)$.
7. Give an example of two lines which intersect at point $(0,-1,3)$ at the right angle. Justify.
8. Give an example of a plane which is orthogonal to the plane $2 x+3 y-4 z=-5$. Explain.
