18.022 Practice Problems, 9/16/2013

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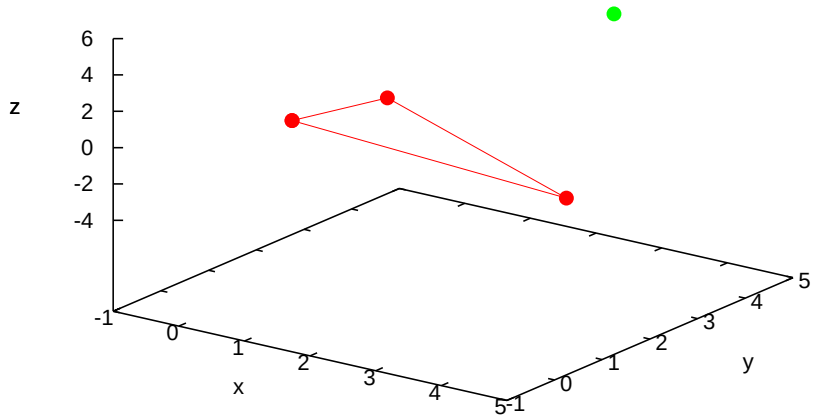
1. Consider the triangle in $\mathbb{R}^3$ with vertices

$$V_1 = (1, 0, 2), \qquad V_2 = (1, 2, 1), \qquad V_3 = (3, 3, -4)$$

and the point P with coordinates

$$P = (3, 4, 5).$$



(i) Find an equation for the plane containing the triangle.

(ii) Compute the distance from P to the plane of the triangle.

(iii) Compute the coordinates of the point P' obtained by projecting P into the plane of the triangle. (P' is the point within the plane of the triangle that lies closest to P.)

(iv) Compute the distances from P' to the three triangle edges.

(v) Compute the distances from P to the three triangle edges.