

## Problem 60 from section 13.5

In problem 60 you are given a point  $P$  and equation of the line  $l$ . You are asked to construct a line passing through a point  $P(0, 1, 2)$ , intersecting given line  $l$  and perpendicular to  $l$ .

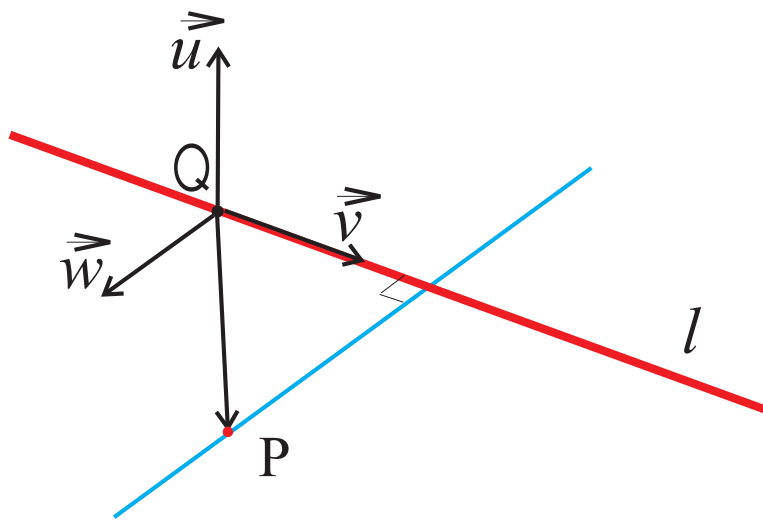


Figure 1: Given information is in red. The line you are looking for is blue.

### The suggested solution:

Pick some point  $Q$  on the line  $l$ . Computing

$$\vec{u} := \overrightarrow{QP} \times \vec{v},$$

gives you a normal to the plane containing both the line  $l$  and the point  $P$ . Taking another cross product

$$\vec{w} := \vec{u} \times \vec{v},$$

gives you the direction of the line you are looking for. Now you know the point on the line and the direction  $\vec{w}$ .