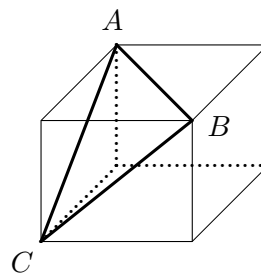
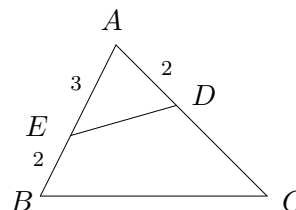


## Some Geometry Problems for Enrichment<sup>1</sup>

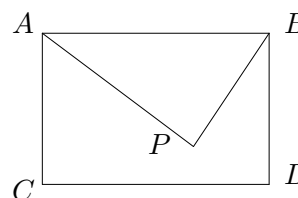
1. Given the cube shown at the right, determine the acute angle between line segments  $AB$  and  $BC$ .



2. In the diagram at the right,  $\angle ABC = \angle ADE$ ,  $|AE| = 3$ ,  $|AD| = 2$  and  $|EB| = 2$ . (The vertical lines mean “length of”.) Find the length of  $DC$ .



3. In rectangle  $ABCD$ ,  $|AD| = 10$  and  $|CD| = 15$ ,  $P$  is a point inside the rectangle such that  $|PB| = 9$  and  $|PA| = 12$ . Calculate the length of  $PD$ .



4. A family of straight lines is determined by the condition that the sum of the reciprocals of the  $x$ - and  $y$ -intercepts is a constant  $k$  for each line in the family. Show that all members of the family are concurrent.
5. The straight line with equation  $2x - 3y + 6 = 0$  is reflected in the line with equation  $y = -x$ . Find the equation of the reflected line.

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<sup>1</sup>borrowed from some books of Canadian Mathematics Competition Problems produced by the University of Waterloo