

Homework 1, due Friday 1/20

1. p. 21, problems 1, 2, 4, 5, 7
2. Consider the line given by the equation $x = 1 + 2t, y = 2 - 3t$.
 - (a) Determine whether the point $(3, 5)$ lies on the line.
 - (b) Sketch the line.
3. Let $P = (2, 3, -1)$ and $Q = (8, 6, -4)$. Check whether the point $R = (4, 4, -2)$ lies on the line segment \overline{PQ} or not.
4. p. 22, problems 13, 15, 20, 21
5. p. 36, problems 1, 3, 4, 11, 16, 17
6. Let l be the line through $P = (2, 1)$ and $Q = (0, -3)$. Find the point R on the line l such that the vector \mathbf{OR} is orthogonal to the vector $\mathbf{v} = (1, -1)$. More precisely, do the following steps:
 - (a) Sketch P, Q and \mathbf{v} (starting at 0). Also sketch R in the picture.
 - (b) Write down the equation of the line l , i.e. write down the points (x, y) on the line in terms of the parameter t .
 - (c) For a point $R = (x, y)$ on the line l write down the vector \mathbf{OR} .
 - (d) Determine for which t we have $\mathbf{v} \cdot \mathbf{OR} = 0$.