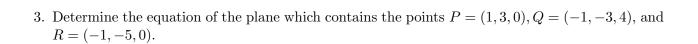
Any plane in \mathbb{R}^3 may be written in the form Ax + By + Cz = D for some real numbers A, B, C, D.

- 1. I'm thinking of a specific plane. [This is being read in Dr. Loft's voice, by the way.] Let's see if you can guess which one....
 - (a) It contains the point P=(1,0,4). If Q=(x,y,z) is any other point on the plane, then the vector \overrightarrow{PQ} is $\overrightarrow{PQ}=\langle \qquad , \qquad , \qquad \rangle$
 - (b) What is the relationship between our plane and the vector \overrightarrow{PQ} ?
 - (c) I happen to know that $\overrightarrow{n} = \langle -1, 5, 2 \rangle$ is orthogonal to this plane. What can you say about the relationship between the vectors \overrightarrow{n} and \overrightarrow{PQ} ?
 - (d) Write this down as an equation and simplify it. Write it in the above form.

We say the plane \overrightarrow{n} used above is normal to the vector \overrightarrow{n} . This vector is called a normal vector.

2. Determine the equation of the plane which is normal to the vector $\overrightarrow{n} = \langle 7, 10, -5 \rangle$ and contains the point P = (-2, -3, 9).



- 4. The next few exercises have you work with the plane 5x 3y + z = 10.
 - (a) Let $\overrightarrow{v} = \langle 5, -3, 1 \rangle$. Where did I get this vector?
 - (b) Locate two points P and Q in this plane. [Use trial and error here....]

(c) Is \overrightarrow{PQ} orthogonal to the vector $\overrightarrow{v} = \langle 5, -3, 1 \rangle$?

5.	Locate a	vector	normal	to the	e plane	-7x+u	-10z = 9	١.

7. Are the planes
$$2x - 4y + z = 7$$
 and $x - 5y - z = 10$ parallel?

8. Are the planes x + 2y - 4z = 9 and 2x - 5y - 2z = 10 parallel? Are they orthogonal?