extraTIPSquest

March-19-13
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1. A plane has a line $(x,y,z) = (-1,0,5) + t(7,3,1)$ on it and a vector $\vec{v} = (-2,6,0)$

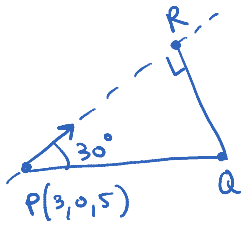
a) Find the equation of the line (in all forms) that's perpendicular to this plane and goes through the origin.

b) State the equation of the plane and then find the point R where the line in a) meets the plane

(2.) $\frac{-x+5}{7} = \frac{y-1}{3} = z$ (a) Find the value of k so that vector $\vec{v} = (3, -6, k)$ is $\perp$ to the given line.

(b) pt. $Q = (-5, 1, 0)$ is on the line, find two possible points R, 4 units away from Q in the direction of $\vec{v}$

3. Consider the given picture of a plane with line $\left\{\begin{array}{l} x = 3 - t \\ y = t \\ z = 5 + 2t \end{array}\right\}$ that has pts P and R



and point Q, such that $|\overrightarrow{PQ}| = 5$

a) Find $|\overrightarrow{RQ}|$

b) Find point R

(4.) Given line: $y = 3$, $\frac{x-3}{2} = \frac{z+5}{-1}$ and a pt. $Q(7, -8, 0)$

a) Find the shortest distance from Q to the line

b) Find point R on the line where minimum distance occurs

c) Find the symmetric equation of the line with pts R and Q

5. Given line: $3x - 5y + 10 = 0$ and a pt. $Q(7, 0)$

a) Find the shortest distance from Q to the line

b) Find point R on the line where minimum distance occurs

c) Find the symmetric equation of the line with pts R and Q

6. Skew lines (that do not intersect) are given

① $(x,y,z) = (0,2,1) + t(2,-1,1)$

and ② $(x,y,z) = (1,0,1) + r(1,-2,0)$

Find pt. R on line ① and pt. Q on line ②
such that $\overrightarrow{RQ}$ is of smallest size possible