Calc 3 HW: Distances + Intersections

Note Title 2/7/2013

(1) Find the following distances:

a) between $P(2,-5,8)$ and the plane $x-2y-2z=2$

b) between $P(3,-2,1)$ and $4x-6y-z=5$

c) between $P(1,2,3)$ and $\ell(t)=\langle 2,1,-3\rangle+t\langle 2,2,-6\rangle$

d) between planes $x+2y-z=1$ and $3x+6y-3z=5$

e) between planes $3x+6y-9z=4$ and $x-2y+z=3$

f) between $P(-3,4)$ and line $y=2x-5$

(2) Find line of intersection between planes $x+y+z=1$ and $x-2y+3z=1$

(3) Find the distance between

a) $P(1,2,3)$ and $\ell(t)=\langle -1,1,-1\rangle+t\langle 2,3,1\rangle$

b) $P(3,0,4)$ and $\ell(t)=\langle 2,-3,5\rangle+t\langle 1,+3,-1\rangle$

(4) Review the formula for the distance between $P(x_0,y_0,z_0)$ and $ax+by+cz+d=0$ and explain why the distance is zero if P is on the plane.

(5) Find the distance between $\ell_1(t)=\langle 2,0,1\rangle+t\langle 1,1,0\rangle$ and $\ell_2(t)=\langle 0,1,1\rangle+t\langle -1,1,-1\rangle$