Challenge Set #3

1) Determine two lines in the form $(x,y,z)=(x_0,y_0,z_0)+k(d_1,d_2,d_3)$ that are skew and $d_1,d_2,d_3 \neq 0$.

2) Find the symmetric equations of the line that passes through the point (0,1,2) as well as the lines $x=y=z+2$ and $\frac{x}{-2}=\frac{y+3}{1}=\frac{z}{3}$.

3) For what value of *k* will the lines $\frac{x-k}{3}=\frac{y+4}{2}=\frac{z+6}{1}$ and $(x,y,z)=(1,1,2)+m(3,-1,-1)$ have:
   a) one point of intersection
   b) no points of intersection

4) Consider the lines $(x,y,z)=(1,-1,1)+k(3,2,1)$ and $(x,y,z)=(2,-3,0)+t(1,2,3)$. Find the vector equation of the line that is perpendicular to, and passes through these two lines.

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