No Calculators, closed book, no lecture notes, no homework. Show steps.

1. Calculate the scalar and vector projections of $\vec{b} = <2, 3>$ onto $\vec{a} = <3, -1>$

2. Find a vector orthogonal to the plane defined by the three points $P(1, 0, -1)$, $Q(2, 4, 5)$, and $R(3, 1, 7)$

3. Find an equation of the plane that passes through the point $(1, 6, -4)$ and contains the line
   
   $x = 1 + 2t$, $y = 2 - 3t$, $z = 3 - t$