1. Find the equation of the plane whose intercepts are 
   $$(0,0,5), (0,2,0) \text{ and } (0,0,4).$$
2. Show that the line through $$(-2,4,0), (1,1,1)$$ and the line through 
   $$(2,3,4), (3,-1,-8)$$ are not perpendicular.
3. Find the range of the function $$f(x, y) = x^2 + 5y^2 - 2.$$