[12.5] Show (i) that *d**x*2 has components <0, 1, 0, … , 0> and (ii) represents the tangent hyperplane elements to *x*2 = constant.

(i)



Using component notation,  ✔

(ii)

Let Φ = ******. Then dΦ = d****** = <0, 1, 0, … , 0>. This implies that Φ is constant on the (*n*‑1)-dimensional hyperplane *x*1 ×*x*3 ×*x*4 ×  × *xn.* That is, the hyperplane is tangential to the surface of constant Φ. ✔