

10. $P(0, 2, 4)$ $\nabla f(P) = \langle 0, 4, -1 \rangle$ $N = (1, 1, 4)$

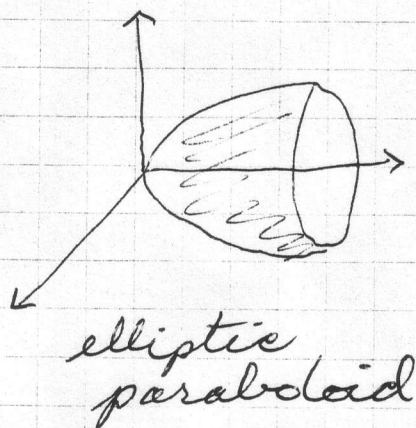
Show $\nabla f(P) \cdot N = 0$

eqn of plane. $4y - z = 4$

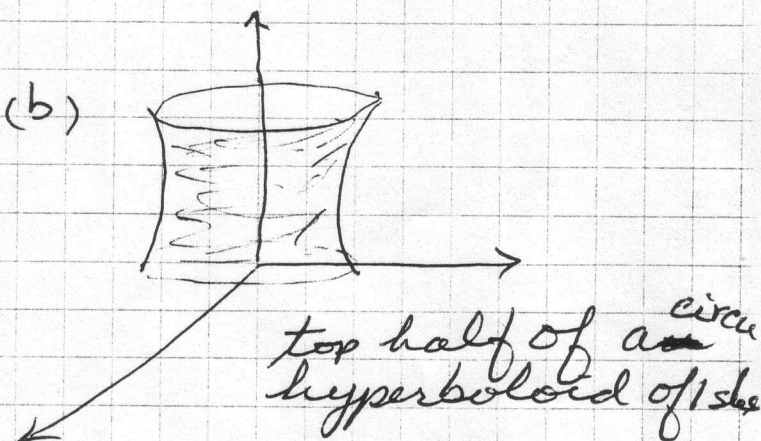
11. Saddle pt. @ $(0, 0)$
maxima @ $(4, 16)$ and $(4, -16)$

12. $P(-5/3, -1/6, 25/6)$

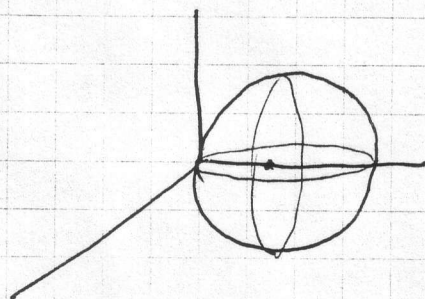
13. (a)



(b)



(c)



sphere $\left\{ \begin{array}{l} C(0, \frac{1}{2}, 0) \\ r = \frac{1}{2} \end{array} \right.$

14. $\frac{1}{4} \ln(17)$

15. $\int_0^{\pi/4} \int_0^{2\sqrt{2}} r^2 dr d\theta$

16. $\frac{2(6\sqrt{6} - 11)\pi}{3} \approx 7.74$