

**HOMEWORK 4 (DUE WEDNESDAY FEBRUARY 3)**

- (1) (Problem 10 in §13.3) For  $\mathbf{r}(t) = (4\sqrt{t}, \ln(t), 2t)$  compute the length of the curve from  $t = 1$  to  $t = b$ .
- (2) (Problem 29 in §14.5) Calculate the directional derivative of the function  $g(x, y, z) = xe^{-yz}$  in the direction of the vector  $(1, 1, 1)$  at the point  $(1, 2, 0)$ .
- (3) (Problem 10 in §14.4) Find an equation of the tangent plane of the function  $f(x, y) = \ln(4x^2 - y^2)$  at the point  $(1, 1)$ .