

**MATH 231: Calculus of Several Variables**  
**Section 1, 107 Ag Sc & Ind Bldg,**  
**TR 9:05 AM - 9:55 AM**

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**Homework 19:** Due Thursday, November 14

1. Find an equation of the tangent plane to the surface at the given point

(a)  $f(x, y) = \sqrt{x + 2y}$ ,  $(0, 2)$

(b)  $f(x, y) = xe^{xy+1}$ ,  $(-1, 1)$

(c)  $f(x, y) = 3x^2 + y^2$ ,  $(1, 2)$

2. Estimate the values with the given information

(a) Suppose  $f(2, 3) = 7$ ,  $f_x(2, 3) = 10$ , and  $f_y(2, 3) = -2$ . Estimate  $f(2.1, 3.2)$ .

(b) Suppose  $f(1, -1) = 2$ ,  $f_x(1, -1) = -1$ , and  $f_y(1, -1) = 3$ . Estimate  $f(2, 0)$ .