Bilkent University	Quiz # 09 Math 102 Section 08 Calculus II 15 April 2024 Monday Instructor: Ali Sinan Sertöz Name & Lastname:	
Department:		

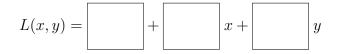
**Q-1)** Let z = z(x, y), x = x(u, v), y = y(u, v), u = u(s, t) and v = v(s, t) be differentiable functions of their variables. We have the following data:

u(3,7) = 9	v(3,7) = 11	u(7,3) = -9	u(7,3) = -10
$u_s(3,7) = 12$	$v_s(3,7) = -1$	$u_t(3,7) = 2$	$v_t(3,7) = -3$
x(9,11) = -3	y(9,11) = 3	x(3,7) = 12	y(3,7) = -8
$x_u(9,11) = 4$	$y_u(9,11) = 5$	$x_u(3,7) = -12$	$y_u(3,7) = 6$
$x_v(9,11) = -6$	$y_v(9,11) = 7$	$x_v(3,7) = 4$	$y_v(3,7) = 14$
z(-3,3) = 16	z(9,11) = 17	z(3,7) = 18	z(12, -8) = 19
$z_x(-3,3) = -2$	$z_y(-3,3) = 9$	$z_x(9,11) = 2$	$z_y(9,11) = -9$
$z_x(3,7) = 5$	$z_y(3,7) = 13$	$z_x(12,-8) = -5$	$z_y(12, -8) = -7$

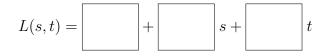
Fill in the following boxes with numbers using this table. No questions asked!



The linearization of z as a function of x and y at the point (x, y) = (12, -8) is



The linearization of z as a function of s and t at the point (s, t) = (3, 7) is



Grading: Each correctly filled box is 1 point. Grader: melis.gezer@bilkent.edu.tr