MATH 32A Problem Set 7

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1 Question 1

Suppose the tangent plane to a function $g(x, y)$ at a point P has a normal vector $\langle 0, -1, 1\rangle$. If you increase the value of y by a small amount, do you expect that the function will increase in value, decrease in value, or stay the same? Explain your answer.
Let's take into consideration the tangent plane. Let $P = (x_0, y_0)$ The equation of the tangent plane is:

$$0(x - x_0) - 1(y - y_0) + (g(x, y) - g(x_0, y_0)) = 0$$

$$g(x, y) = y - y_0 + g(x_0, y_0)$$

From this simplified form, we can see that if we increase the value of y, the function $g(x, y)$ will increase as well.