

i. Diferencial y plano tangente

2. a. i. $z_t = -1$ ii. $z_t = -2 + 2(x-1) + 2(y+1)$ iii. $z_t = 9/5 + 48/125 (x-3) - 36/125 (y-4)$
 b. $F(1,01; 0,98) \cong -1$ $G(1,01; -0,98) \cong -1,94$ $H(2,9; 4,01) \cong 1,75872$

3. 2448π

4. 0.005817

5. a. $\text{Dom}F = \{(x, y) \in \mathbb{R}^2 : xy - x + 1 > 0, 9 - x^2 \geq 0\}$
 b. $F(5,02; 1,01) \cong 0,1$

6. $dF(-1,2) = -4\Delta x + \Delta y$

7. $z_t = 5 + (x+1) - 4(y-1)$

8. a. $z_t = 20 - 8(x+3) + 6(y-1)$, $X = \alpha(-8, 6, -1) + (-3, 1, 20)$ $\alpha \in \mathbb{R}$
 b. $z_t = 1 - 2(x+1) + 3(y-1)$, $X = \alpha(-2, 3, -1) + (-1, 1, 1)$ $\alpha \in \mathbb{R}$
 c. $z_t = -5(x-\pi) + 2(y-\pi/2)$, $X = \alpha(-5, 2, -1) + (\pi, \frac{\pi}{2}, 0)$

9. A. $\vec{n} = (-1, 2, 2)$ b. $\vec{n} = (4, 0, -1)$ c. $\vec{n} = (\frac{1}{2}, \frac{1}{2}, -1)$

10.

a. $z = \sqrt{4 - x^2 - y^2}$,
 b. $z_T = \sqrt{2} - \frac{\sqrt{2}}{2}(x-1) - \frac{\sqrt{2}}{2}(y-1)$

ii. Polinomio de Taylor y de Mac. Laurin. Aproximaciones.

11. a. $e^{-x^2-y^2} = 1 - x^2 - y^2 + T_3$
 b. $(x-1)^y = 1 + 2(x-2) + (x-2)^2 + (x-2)(y-2) + T_3$
 c. $x \ln y = 2(y-1) + (x-2)(y-1) - (y-1)^2 + T_3$

12. $F(x; y) \cong y$

14. No hay diferencia, las tres expresiones son equivalentes.

15. $y^3 - 2xy + x^3 = -4 + 5(x+1) + 5(y+1) - 3(x+1)^2 - 2(x+1)(y+1) - 3(y+1)^2 + (x+1)^3 + (y+1)^3$