$f : \Re^2 \to \Re$
$P = (1, 2, f(1, 2))$
$\Phi : z = x + 2y - 1$
$f(1, 2) = z = 1 + 4 - 1 = 4$
$P = (1, 2, 4)$
$F(s, t) = f(3s + t^2, 2s^2 + 2t)$
$F(0, 1) = f(1, 2)$
$P_2 = (0, 1, 4)$

$\boldsymbol{\nabla} F(s, t) = (F_s(s, t), F_t(s, t))$

- $F_s(s, t) = f_x(x(s, t), y(s, t)) \cdot x_s(s, t) + f_y(x(s, t), y(s, t)) \cdot y_s(s, t) =$
  $f_x(x(s, t), y(s, t)) \cdot 3 + f_y(x(s, t), y(s, t)) \cdot 4s$
  $\Rightarrow F_s(0, 1) = f_x(1, 2) \cdot 3 + f_y(1, 2) \cdot 0$
  $\Rightarrow F_s(0, 1) = 1 \cdot 3 + 2 \cdot 0 = 3$
- $F_t(s, t) = f_x(x(s, t), y(s, t)) \cdot x_t(s, t) + f_y(x(s, t), y(s, t)) \cdot y_t(s, t) =$
  $f_x(x(s, t), y(s, t)) \cdot 2t + f_y(x(s, t), y(s, t)) \cdot 2$
  $\Rightarrow F_t(0, 1) = f_x(1, 2) \cdot 2 + f_y(1, 2) \cdot 2$
  $\Rightarrow F_t(0, 1) = 1 \cdot 2 + 2 \cdot 2 = 6$

$z = \boldsymbol{\nabla} F(0, 1) \cdot (s, t - 1) + F(0, 1) =$
$\boldsymbol{\nabla}(3, 6) \cdot (s, t - 1) + 4 =$
$3s + 6(t - 1) + 4$
$\Rightarrow z = 3s + 6t - 2$