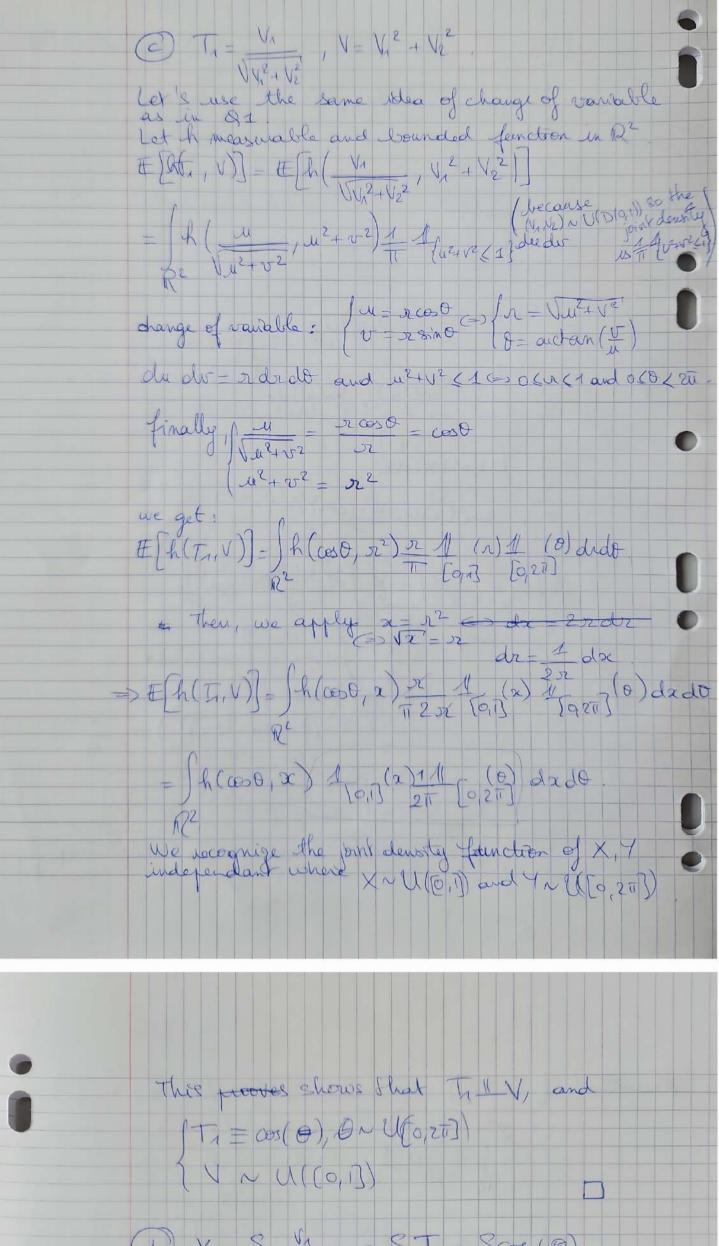
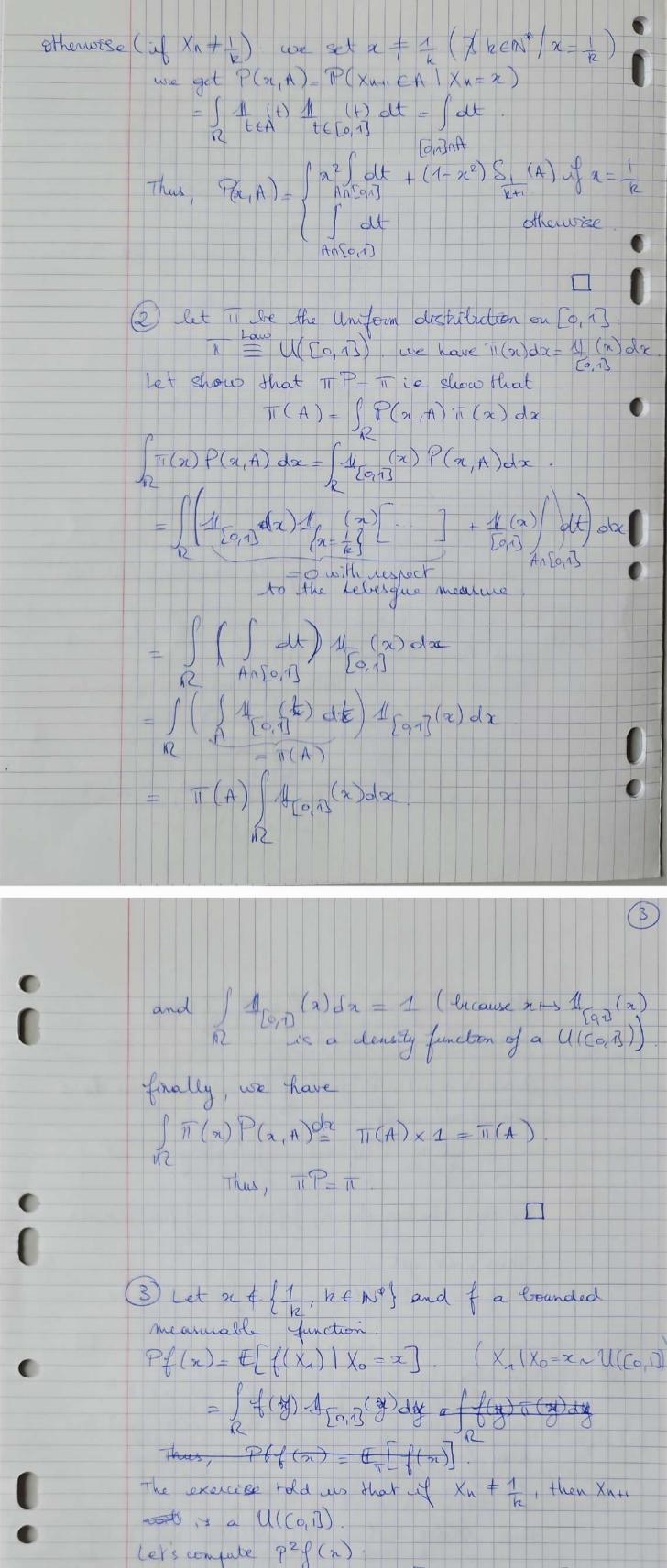


Thus, let's right an algorithm simulate U, NU[0,1], Ue NU[0,1] symulate of R = V-2ln U,

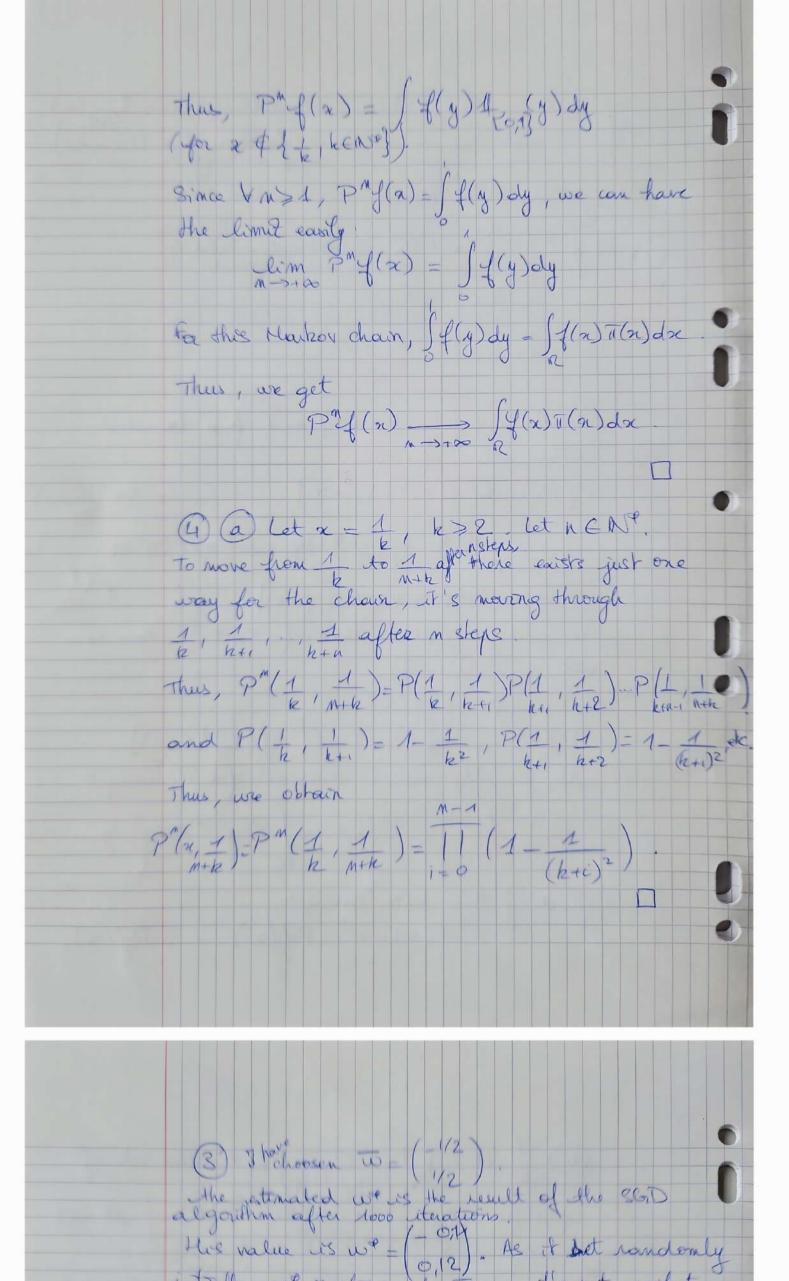
O = 24 Uz simulate X = R cos O = cos(20 Uz) V-2 ln Un 7 = RSm 0 = sin (2002) V - 2-la Ua Thus, X and Y are two simulations of independant gaussians distribution W (0, 1). (3)(a) V, ~ U[-1,1], V2 ~ U[-1,1] ( before the while loop) The while loop is used to simulate is and 12 in the unit disk, emformly. Hence, after the while cloop, the couple (V1, V2) has uniform distribution on the unit disk (b) We are looking at the janameters of a geometric judialolity distribution. The van random variable \$12+12 <13 N (good P) where p is what we are looking for (the first success) during the while look I and be are uniform random variable lectured - 1 and 1. E TYSTVE EN = 4 ) 1/14/5 1-02} der der  $= \frac{1}{4} \int \int \int du dv$ - 1 / (J1-v2 - (- J1-v2) dv = 1 (2 \ 1 - cos (2) (- sm(n)) dz  $=\frac{1}{2}\int \sin^2(\pi)dx$  $\int_{-\infty}^{\infty} e^{2}(x) - 1 - \cos(2x)$  $E\left[\frac{1}{V_{1}^{2}+V_{2}^{2}}\leq1\right]=\frac{1}{2}\int_{-\infty}^{\infty}\frac{1-\cos(2x)}{2}dx$  $=\frac{1}{4}\left(\int 1 dx - \int \cos(2x) dx\right)$ Thus E[1 4 + 1 = 1 = 4 = 7 = 4 the expected number of skys in the "white" loop



The cos( $\Theta$ ),  $\Theta$  ~ U(0,27) \\
\[
\begin{align\*}
\text{V} & \text{V}\_1 & \text{ST}\_2 & \text{Scos}( $\Theta$ ) \\
\text{V}\_1^2 + \text{V}\_2^2 \\
\text{V}\_1^2 + \text{V}\_2^2 \\
\text{V}\_1^2 + \text{V}\_2^2 \\
\text{V}\_2^2 + \text{V}\_2^2 \\
\text{V}\_2^2 + \text{V}\_2^2 \\
\text{V}\_2^2 + \text{V}\_2^2 \\
\text{Distribution} & \text{V}\_2 & \text{V}\_2^2 \\
\text{Distribution} & \text{V}\_2^2 + \text{V}\_2^2 \\
\text{Thus, with QL, we can conclude that \\
\begin{align\*}
\text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_2 & \text{V}\_1^2 & \text{V}\_2 & \text{V}\_2 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_2 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 & \text{V}\_2 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 & \text{V}\_2 \\
\text{V}\_1 & \text{V}\_2 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 \\
\text{V}\_2 & \text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 \\
\text{V}\_2 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_2 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_2 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_2 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_2 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_1 & \text{V}\_2 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_1 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 & \text{V}\_1 & \text{V}\_2 \\
\text{V}\_1 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 & \text{V}\_2 & \text{V}\_1 & \text{V}\_2 & \t



Let's compute  $P^2f(n)$ :  $Pf(n) = P(Pf(n)) = E[Pf(X_n)]X_0 = 2$ But, as U(o,n) is invariant for P, we get  $P^2f(n) = Pf(n) - f(y) + f($ 



initially we is close to to, as it's not perfect we can improve the value of we by charging the learning rate or take small clatches of data

(1) Adding Gaussian noise make us les accurate .

