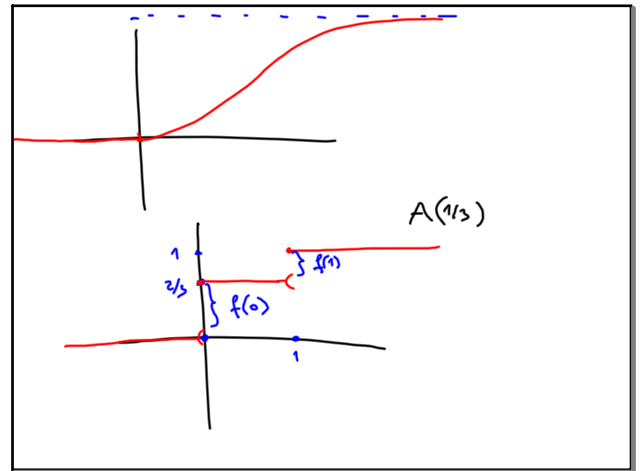
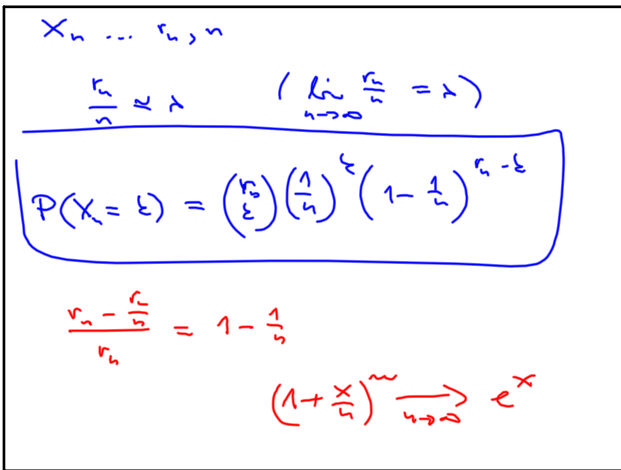


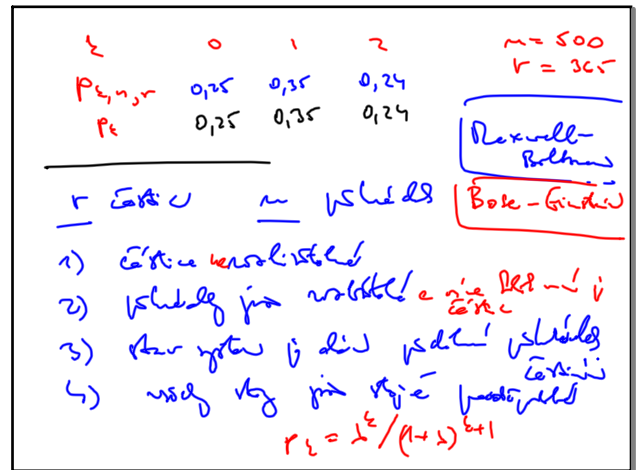
4 16-18:06



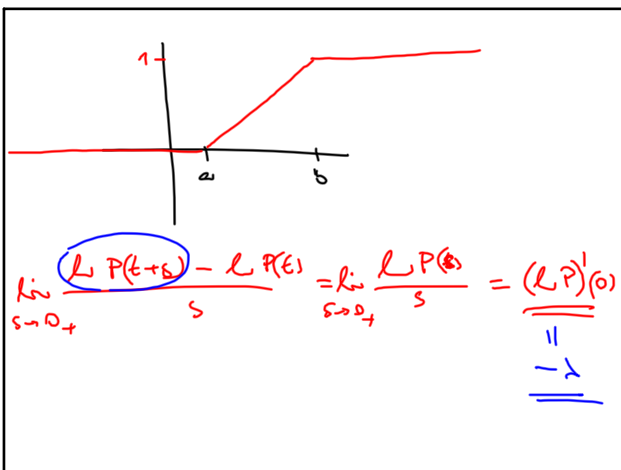
4 16-18:18



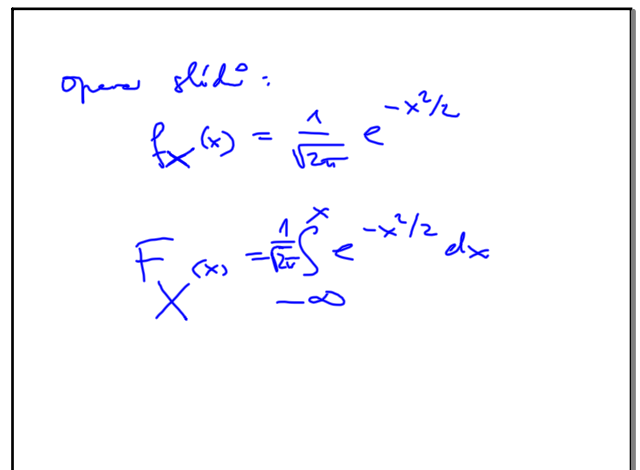
4 16-18:34



4 16-18:42

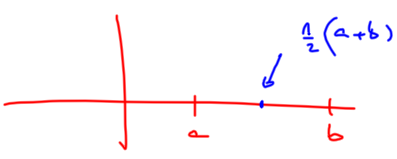


4 16-18:51



4 16-19:07

$$\int_a^b x f(x) dx = ?$$

$$\int_a^b \frac{1}{b-a} dx = \frac{1}{b-a} (b^2 - a^2) = \frac{1}{2}(a+b)$$


4 16-19:21

$$E(a+bx) = \int_{-\infty}^{\infty} (a+bx) f_X(x) dx$$

$$= a \underbrace{\int_{-\infty}^{\infty} f_X(x) dx}_1 + b \cdot \underbrace{\int_{-\infty}^{\infty} x f_X(x) dx}_{E(X)}$$

$$= a + bE(X)$$

4 16-19:28

$$E(X+Y) = \sum_{i=1}^{\infty} \sum_{j=1}^{\infty} (x_i + y_j) P(X=x_i, Y=y_j)$$

$$= \sum_{i=1}^{\infty} x_i P(\cdot) + \sum_{j=1}^{\infty} y_j P(\cdot)$$

||  $P(X=x_i, Y=y_j)$

$$= \sum_{i=1}^{\infty} x_i P(X=x_i) + \sum_{j=1}^{\infty} y_j P(Y=y_j)$$

$$= E(X) + E(Y)$$

4 16-19:33

$$X \sim \text{Exp}(\lambda)$$

$$f_X(x) = \lambda e^{-\lambda x}$$

$$EX = \int_0^{\infty} x \lambda e^{-\lambda x} dx$$

$$= [-x e^{-\lambda x}]_0^{\infty} + \int_0^{\infty} e^{-\lambda x} dx$$

$$= \frac{1}{\lambda} \int_0^{\infty} f_X(x) dx = \frac{1}{\lambda}$$

4 16-19:37