

$x^2 + px + q = 0$ reella rötter om

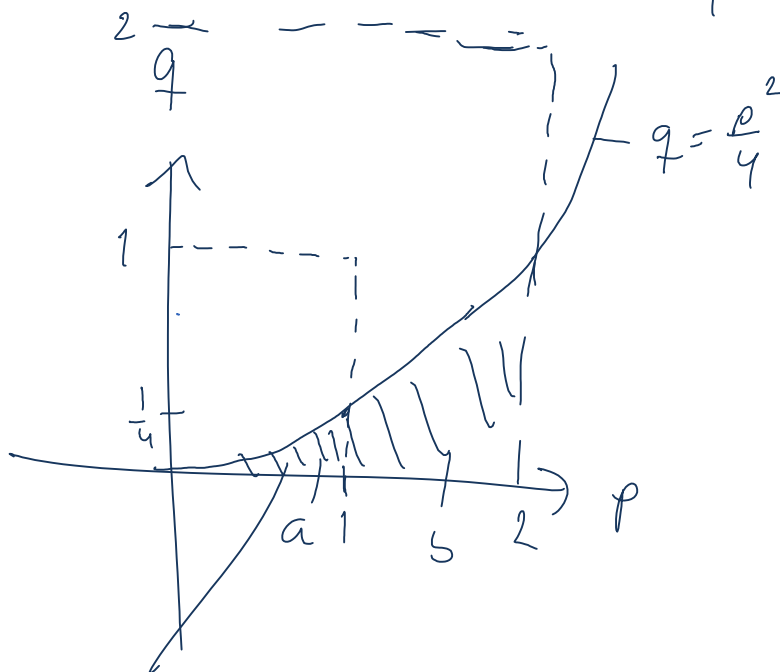
a) $p, q \in [0, 1]$

reella rötter om $\min \leq 0$.

$$x^2 + px + q = \left(x + \frac{p}{2}\right)^2 - \left(\frac{p}{2}\right)^2 + q$$

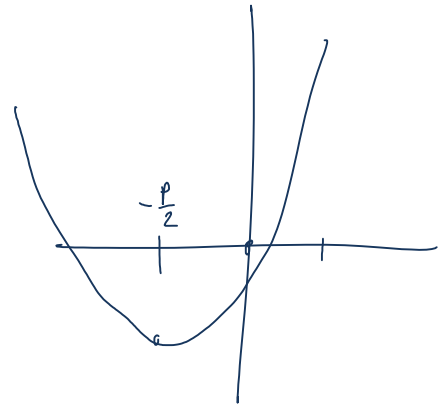
Min i $\left(-\frac{p}{2}, -\frac{p^2}{4} + q\right)$.

Reella rötter om $-\frac{p^2}{4} + q \leq 0 \Leftrightarrow q \leq \frac{p^2}{4}$



$$\int_0^1 \frac{p^2}{4} dp = \left[\frac{p^3}{12} \right]_0^1 = \frac{1}{12}$$

$$P(\text{reella}) = \frac{\frac{1}{12}}{1} = \frac{1}{12}$$



$$P(\text{recess}) = \frac{12}{1} = \underline{\underline{\frac{1}{12}}}$$

$$b) \int_0^2 \frac{p^2}{4} dp = \frac{8}{12} = \frac{2}{3}$$

$$P = \frac{2/3}{4} = \frac{2}{12} = \underline{\underline{\frac{1}{6}}}$$

$$c) \int_0^4 \frac{p^2}{4} dp = \frac{64}{12} = \frac{16}{3}$$

$$P = \frac{16/3}{16} = \underline{\underline{\frac{1}{3}}}$$