

Präsenzübungen zur Vorlesung

Quantenalgorithmen

WS 2013/2014

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Exercise 1:

1. Show that for $m \nmid y$

$$\sum_{k=0}^{m-1} (e^{2\pi i \frac{y}{m}})^k = 0.$$

2. Show that

$$\left| \frac{e^{2\pi i \frac{r}{2^n} m \delta_l} - 1}{e^{2\pi i \frac{r}{2^n} \delta_l} - 1} \right|^2 = \frac{\sin^2(\pi \frac{r}{2^n} m \delta_l)}{\sin^2(\pi \frac{r}{2^n} \delta_l)}.$$

Exercise 2:

Find the order of 7 in \mathbb{Z}_{30}^* .

Exercise 3:

Find the discrete logarithm:

$$3^x \equiv 6 \pmod{7}.$$