

Präsenzübungen zu Vertiefung Elementare Zahlentheorie

WS 2010/2011, Blatt 6

Präsenzaufgabe 21. (a) Show for $m \geq 1$:

$$6|m \implies \phi(m) \leq m/3.$$

(b) Determine all $m \geq 1$ such that $4 \nmid \phi(m)$.

Präsenzaufgabe 22. For $m = 10, 11, 12$ and all a relatively prime to m , determine the order $t_m(a)$. In each case, which a are primitive roots?

Präsenzaufgabe 23. Which $m \leq 50$ do not admit a primitive root? (You can use the general result that was mentioned without complete proof.)

Präsenzaufgabe 24. Check: 2 is a primitive root modulo 19, but not modulo 23. 5 is a primitive root modulo 23.