

$$\text{Q}_1 \quad n=330 \\ 5 \mid 330 \quad d=5$$

$$M = \{0 < a \leq 330 \mid \gcd(a, 330) = 5\}$$

Find size of $M = |M|$.

$$\text{Q}_2 \quad n = 11^5 \times 2^7 \times 13^2 \\ d=26, d \mid n.$$

$$M = \{0 < a \leq n \mid \gcd(a, n) = 26\}$$

Find $|M|$.

Solution to (1)

$$\textcircled{1} \quad \phi\left(\frac{n}{d}\right) = \phi\left(\frac{330}{5}\right) = \phi(66) =$$

$$\text{ppz } 66 = 2 \times 3 \times 11$$

$$\phi(66) = 1 \times 2 \times 10 = \underline{20} = |M|$$

Solution to 2

$$\textcircled{2} \quad \phi\left(\frac{11^5 \times 2^7 \times 13^2}{26}\right) = \phi(11^5 \times 2^6 \times 13) =$$

$$m = 11^5 \times 2^6 \times 13$$

$$\phi(11^5 \times 2^6 \times 13) = 10 \times 11^4 \times 1 \times 2^5 \times 12 \\ = \underline{56221440} = |M|$$