Q(1)
$n = 10$

$10 > 2$

$i = 10^{1/25}$

$n^{1/25^k} = 2$

$\frac{1}{25}k \log_2 n = 1$

$\log_2 n = 25^k$

$\log_{25} \log_2 n = k \log_{25} 25$

$k = \log_{25} \log_2 n$

$$\boxed{O(\log(\log n))}$$

Q(2)

$i = 29$

while $i < n$:

$i = i^{23}$

$(29)^{23^k} = n$

$\log_n (29)^{23^k} = \log_n n$

$\log_n (29)^{23^k} = 1$

$23^k \log_n (29) = 1$

$\log_n (29) = \frac{1}{23^k}$

$$\boxed{k = \log_{23}(\log_{29} n)}$$

$$\boxed{O(\log(\log n))}$$

Q9) $i = 1$

while $i < n$:
$$\left\{ \begin{array}{l} i = 2 * i \\ i = 3 * i \end{array} \right\}$$

$\longrightarrow i = 6 * i$

$n = 40$

$i = 6 \times 1$
$i = 6 \times 6$
$i = 6 \times 36$

$$\boxed{O(\log_6 n)}$$