

$$d) T(n) = 7 \cdot T\left(\frac{n}{3}\right) + n^3$$

$$k = \log_3 7$$

$$f(n) = n^3$$

$\Rightarrow f(n)$ grows faster than $n^{(\log_3 7)}$

$$\text{Thus, } T(n) = \Theta(n^3)$$

$$e) T(n) = T\left(\frac{n}{2}\right) + n(2 - \cos n)$$

$$k = \log_2 1 = 0$$

$$f(n) = 2n - n \cos n$$

\Rightarrow Master theorem doesn't apply because regularity condition is violated