$$T(n) = aT(n/b) + c * n^d$$

① $T(n) = 8T(n/2) + 1000n^2$

$\quad a = 8 \qquad b = 2 \qquad c = 1000 \quad d = 2$

$\quad b^d = 4$

$\quad a > b^d$.

$T(n) \in n^{\log_2 a}$

$T(n) \in n^{\log_2 8} \qquad T(n) \in n^3$

② $T(n) = 2T(n/2) + n^2$

$T(n)$

$\quad a = 2 \qquad\qquad b = 2 \qquad\qquad d = 2$

$\quad a < b^d$

$\quad 2 < 4$

$\quad T(n) \in n^d$

$\quad T(n) \in n^2$

③ $T(n) = 2T(n/2) + 10n$

$\quad a = 2 \qquad b = 2 \qquad d = 1$

$\quad a = b^d$

$\quad T(n) = n^d \log n = n \log n$

$$T(n) = aT(n/b) + c * n^d$$

(1) $\quad T(n) = 8T(n/2) + 1000n^2$

$$a = 8 \qquad b = 2 \qquad c = 1000 \quad d = 2$$
$$b^d = 4$$
$$a > b^d$$
$$T(n) \in n^{\log_2 a}$$
$$T(n) \in n^{\log_2 8} \qquad T(n) \in n^3$$

(2) $\quad T(n) = 2T(n/2) + n^2$

$T(n)$

$$a = 2 \qquad b = 2 \qquad d = 2$$
$$a < b^d$$
$$2 < 4$$
$$T(n) \in n^d$$
$$T(n) \in n^2$$

(3) $\quad T(n) = 2T(n/2) + 10n$

$$a = 2 \qquad b = 2 \qquad d = 1$$
$$a = b^d$$
$$T(n) = n^d \log n = n \log n$$