$$T(n) = cn^2 + 8T\left(\frac{n}{2}\right) = cn^2 + 8\left(c\left(\frac{n}{2}\right)^2 + 8T\left(\frac{n}{2^2}\right)\right)$$

$$= cn^2 + 8\left(c\left(\frac{n}{2}\right)^2 + 8\left(c\left(\frac{n}{2^2}\right)^2 + 8T\left(\frac{n}{2^3}\right)\right)\right)$$

$$= cn^2 + 8c\frac{n^2}{4} + 8^2 c\frac{n^2}{4^2} + 8^3 T\left(\frac{n}{2^3}\right)$$

$$= cn^2\left(1 + 2 + 2^2\right) + 8^3 T\left(\frac{n}{2^3}\right)$$

$$\vdots$$

$$= cn^2 \cdot \sum_{i=0}^{\log_2 n - 1} 2^i + 8^{\log_2 n} T\left(\frac{n}{2^{\log_2 n}}\right) = T(1) / T(2)$$

$$= cn^2 \frac{2^{\log_2 n} - 1}{2 - 1} + n^{\log_2 8} \cdot c'$$

$$= cn^3 - cn^2 + c'n^3 = \Theta(n^3)$$

$$T(n) = 8\,T\left(\frac{n}{2}\right) + \Theta(n^2)$$

$a = 8, \quad b = 2 \qquad k = 2$

$\log_b a \gtreqless k \qquad 3 = \log_2 8 > 2 \rightarrow T(n) = \Theta(n^3)$

$$T(n) = 7\,T\left(\frac{n}{2}\right) + \Theta(n^2) \rightarrow T(n) = \Theta(n^{\log_2 7})$$

$\log_2 7 = \log_b a \gtreqless k = 2$