(d) $\log\left(\frac{n}{\log n}\right) = \Theta(\log n)$

$\exists c_1, c_2, n_0 > 0 \; : \; c_1 \log n \le \log \frac{n}{\log n} \le c_2 \log n$

$\log \frac{n}{\log n} \ge c_1 \log n$

$\log\left((n)(\log n)^{-1}\right) \ge c_1 \log n \iff \log n - \log \log n \ge c_1 \log n$

Non è possibile trovare opportune costanti affinché valga la seguente relazione.

(e) $5n\sqrt{n}\log n^2 + 10n^2 = \Theta(n^2)$

$\exists c_1, c_2, n_0 > 0 \; : \; c_1 \cdot n^2 \le 5n\sqrt{n}\log n^2 + 10n^2 \le c_2 n^2$

$5n\sqrt{n}\log n^2 + 10n^2 \ge c_1 \cdot n^2$

$2 \cdot 5n\sqrt{n}\log n + 10n^2 \ge c_1 \cdot n^2 \iff$ $\qquad c_1 = 1 \quad \forall n \ge 1$

$c_2 \cdot n^2 \ge 10n\sqrt{n}\log n + 10n^2 \iff$

$c_2 n^2 \ge 10n(\sqrt{n}\log n + n) \iff c_2 n^2 \ge 10n(\sqrt{n}\log n + n)$

$10n(2n) \ge 10n(\sqrt{n}\log n + n)$ Verificata $\iff c_2 n^2 \ge 20n^2$

$c_2 = 20 \quad \forall n \ge 2$