CMPUT 204
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DATE / / NO

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Proof: $\frac{n^2}{3} - 17n^{1.5} + 12n \in \Theta(n^2)$

Take: $c_1 = \frac{1}{6}$ $c_2 = 15$.

$n_0 = 10404$

Fix any $n \geq n_0$

$\frac{1}{3}n^2 - 17n^{1.5} + 12n \leq \frac{1}{3}n^2 - 0 + 12n^2 \leq 15n^2$

$\frac{1}{3}n^2 - 17n^{1.5} + 12n \geq \frac{1}{3}n^2 - 17n^{1.5} + 0 \geq \frac{1}{3}n^2 - \frac{n^{0.5}}{6}n^{1.5} \geq \frac{1}{6}n^2$.

$\frac{n^{0.5}}{6} \geq \frac{(10404)^{0.5}}{6} = \frac{102}{6} = 17$

$\therefore$ $-17 \leq -\frac{n^{0.5}}{6}$.

$\frac{1}{3}n^2 - 17n^{1.5} \leq \frac{1}{3}n^2 - \frac{n^{0.5}}{6}n^{1.5}$

So, $\frac{1}{6}n^2 \leq \frac{n^2}{3} - 17n^{1.5} + 12n \leq 15n^2$

$\frac{n^2}{3} - 17n^{1.5} + 12n \in \Theta(n^2)$ ☒.