(b) $T(n) = 4n^2$

(c) $T(n) = \dfrac{n^3 - 2}{n^2 + 4} + 16n$

$$= n\left(\dfrac{n^2 - \frac{2}{n}}{n^2 + 4}\right) + 16n = n\left(\dfrac{n^2 - \frac{2}{n}}{n^2 + 4} + 16\right).$$

$\displaystyle\lim_{n \to \infty} \dfrac{n^2 - \frac{2}{n}}{n^2 + 4} = 1$ $\Rightarrow$ $\boxed{O(T(n)) = O(n)}$

(d) $T(n) = n\big(n + 3(n + 2(n + 1))\big)$

$$= n\big(n + 3(n + 2n + 2)\big) = n(n + 9n + 6)$$

$$= 10n^2 + 6n$$

$\Rightarrow$ $\boxed{O(T(n)) = O(10n^2) = O(n^2)}$.

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