Q7 $A \cdot B$ takes $\sim 2n^3$ flops

$$A \cdot B = \begin{bmatrix} A_{11} & \cdots & A_{1n} \\ & \times n & \\ A_{n1} & \cdots & A_{nn} \end{bmatrix} \begin{bmatrix} B_{11} & & B_{1n} \\ \vdots & \times n & \vdots \\ B_{n1} & & B_{nn} \end{bmatrix} = n \left\{ \overbrace{\begin{matrix} \overbrace{A_1 B_1 + \dots + A_{1n} B_{n1}}^{(2n-1)\text{ flops}} & \cdots & A_1 B_{1n} + \dots + A_1 B_{nn} \\ \vdots & & \vdots \\ A_{n1} B_{11} + \dots A_{nn} B_{n1} & A_{n1} A_{n1} \cdots & A_{nn} B_{nn} \end{matrix}}^{n} \right.$$

Each individual row, column product takes $2n-1$ flops, going through n columns of B per 1 row of A increases the flops to $n(2n-1)$, finally, doing that for all n rows of A multiples the final result to $n^2(2n-1)$ or $\sim 2n^3$ flops