Special Problem 2-3.2

Circle each of the following expressions (there may be more than one!) that tell you with complete certainty that:

“Vector \( \mathbf{A} \) and vector \( \mathbf{B} \) are either parallel or anti-parallel”

In other words, circle the expressions—that if true—mean that vectors \( \mathbf{A} \) and \( \mathbf{B} \) must be (as opposed to just might be) parallel or anti-parallel.

All vectors are non-zero.

\[
\begin{align*}
\mathbf{A} \times \mathbf{B} &= 0 \\
|\mathbf{A} \times \mathbf{B}| &= |\mathbf{A}||\mathbf{B}| \\
\mathbf{A} \cdot \mathbf{B} &= 0 \\
|\mathbf{A} \times \mathbf{B}| &= \mathbf{A} \cdot \mathbf{B} \\
\mathbf{A} &= \mathbf{B} \\
\mathbf{A} \cdot \mathbf{C} &= \mathbf{B} \cdot \mathbf{C} \\
|\mathbf{A}| &= |\mathbf{B}|
\end{align*}
\]

Give some justification for each circled answer.