① det(A) via the product of eigenvalues:

A 6×6 matrix's determinant equals the product of its eigenvalues, counted with algebraic multiplicity. Here, the eigenvalues are

$$-1 \text{ (mult. 1)},$$
$$1 \text{ (mult. 3)},$$
$$4 \text{ (mult. 2)}$$

Hence:

$$\det(A) = (-1)^1 \cdot 1^3 \cdot 4^2 = -1 \times 1 \times 16 = -16$$

$$\boxed{\det(A) = -16}$$

② $\det(B^2)$ for a matrix B similar to A:

Similarity preserves determinant, so $\det(B) = \det(A) = -16$. Moreover, for any square matrix B,

$$\det(B^2) = (\det(B))^2 = (-16)^2 = 256$$

$$\boxed{\det(B^2) = 256}$$