Step-1

Let A be a 3×3 matrix such that $\det A=-1$.

a) We have to find $\det\left(\frac{1}{2}A\right)$.

We know that if A is an $n\times n$ matrix then $\det(kA)=k^n \det A$.

Now

$$\det\left(\frac{1}{2}A\right)=\left(\frac{1}{2}\right)^n \det(A)$$

$$=\left(\frac{1}{2}\right)^3(-1) \quad (\text{Since } n=3)$$

$$=-\frac{1}{8}$$

Thus, $\boxed{\det\left(\frac{1}{2}A\right)=\frac{-1}{8}}$

Step-2

b) We have to find $\det(-A)$.

Now

$$\det(-A)=-\det(A)$$

$$=-(-1)$$

=1

Thus, $\boxed{\det(-A)=1}$

Step-3

c) We have to find $\det(A^2)$.

We know that $\det(A^n)=(\det A)^n$.

Now

$$\det\left(A^2\right)=\left(\det\left(A\right)\right)^2$$

$$=\left(-1\right)^2$$
$$=1$$

Thus, $\boxed{\det\left(A^2\right)=1}$

Step-4

d) We have to find $\det\left(A^{-1}\right)$.

Now

$$\det\left(A^{-1}\right)=\frac{1}{\det\left(A\right)}$$

$$=\frac{1}{-1}$$
$$=-1$$

Thus, $\boxed{\det\left(A^{-1}\right)=-1}$