Step-1

Consider volume of a box of length *l,* breadth b, height h is given by *lbh.*

Suppose if each side is madeâ€˜*t*â€™ times, then the volume is clearly $tl.tb.th = t^3lbh$

Now det *A* is volume of a box of *n* sides in an *n* - dimensional space.

The objective is to show that $\det 3A = 3^n \det A$ by volume.

Step-2

Now, multiply *A* by 3, each row vector is made 3 times.

So, every side of the given box *A* is made 3 times its original length.

While the case is of 3 dimensions,

So, Volume of the new box= $\det 3A$

$= 3^n.\det A$

Hence, $\boxed{\det 3A = 3^n \det A}$