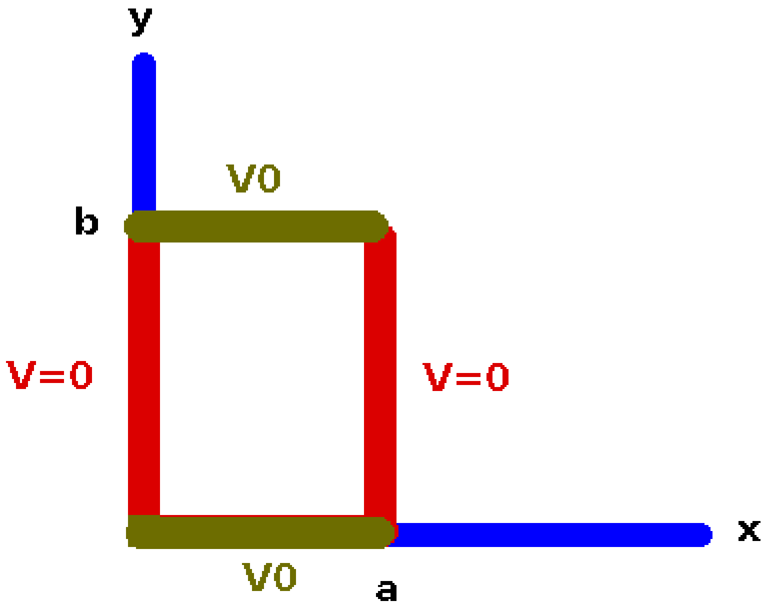


$x=0$, $x=a$ $V=0$: $y=0$, $y=b$ $V=V_0$

Solution:
Switch to the translated coordinate system which is:
x'=x; y'=y-f where f=b/2. Solve the problem in the primed coordinate system, losing the ' notations. (i.e. write in terms of b and without ' and f)

$$V(x,y)=(A\sin(kx)+B\cos(kx))(Ce^{ky}+De^{-ky})$$

$$@x=0, V=0 \Rightarrow B=0$$

$$@x=a, V=0 \Rightarrow ka=n\pi \Rightarrow k=\frac{n\pi}{a}$$

$$V(-b)=V(b) \Rightarrow C=D$$

$$V(x,y)=\sum_{n=0}^{\infty} A_n \sin\left(n\pi\frac{x}{a}\right)\cosh\left(n\pi\frac{y}{a}\right)$$

$$\int_{x=0}^{x=a} V(x,y)\sin\left(m\pi\frac{x}{a}\right)dx=\sum_{n=0}^{\infty} A_n\cosh\left(n\pi\frac{y}{a}\right)\int_{x=0}^{x=a}\sin\left(n\pi\frac{x}{a}\right)\sin\left(m\pi\frac{x}{a}\right)dx=A_m\cosh\left(m\pi\frac{y}{a}\right)\frac{a}{2}$$


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$$V(x,y)=\sum_{n=1,3,5,\ldots}^{\infty}\frac{2aV_0}{n\pi}\frac{\cosh\left(n\pi\frac{(y+b/2)}{a}\right)}{\cosh\left(n\pi\frac{3b/2}{a}\right)}\sin\left(n\pi\frac{x}{a}\right)$$