Technion – Israel Institute of Technology



HW5

Numerical Methods

019003

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| Alon Spinner | 305184335 | alonspinner@gmail.com |
| Oren Elmakis | 311265516 | orenelmakis@gmail.com |

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# Question 1 –

## Show in detail that the approximated pde…

We were asked to use the volume control approach for calculating the points boundary points. We assume the plate is found in steady state, and first we will write the heat balance as follows:

### Point 1 –

We choose the size of control volume as while in the center.

According to the given grid

After the reduction, we get

Now, we will gather all the variables together and move the variable to the right side

### Point 2 –

We choose the size of control volume as while in the center.

According to the second material given grid and

After the reduction, we get

Now, we will gather all the variables together and move the variable to the right side

### Point 3 –

Because of the insulated edge there is no convection flux from the environment. However, the cell is divided to two different materials. We choose the size of control volume as while in the center.

According to the second material given grid

After the reduction, we get

Now, we will gather all the variables together and move the variable to the right side