

# 2021 NA Midterm Solution

1.  $\text{real}^*8 \ A(500, 500)$

$N = 500$

$FN = \text{FRob}(A, N)$

$\text{real}^*8$  function  $\text{FRob}(A, N)$

$\text{real}^*8 \ A(N, *)$   
 $\text{integer} \ N$

$\text{FRob} = 0$

DO  $i = 1, N$

DO  $j = 1, N$

$\text{FRob} = \text{FRob} + A(i, j)^2$

enddo

enddo

$\text{FRob} = \text{SQRT}(\text{FRob})$

return

end.

$$2. a) 0.5 \quad 1.0 \rightarrow 0.75^h$$

$$0.5 \quad 0.75 \rightarrow 0.625$$

$$0.625 \quad 0.75 \rightarrow 0.6875$$

$$b) 0.2 \quad 0.5 \quad 0.694$$

$$0.5 \quad 0.694 \quad 0.6806$$

$$c) 0.5 \rightarrow 0.6807 \rightarrow 0.6806$$

$$3. \frac{\partial f}{\partial x} = 2x, \quad \frac{\partial f}{\partial y} = 8y$$

$$\frac{\partial g}{\partial x} = y^2, \quad \frac{\partial g}{\partial y} = 2xy$$

$$x_0 = (0.9, 1.8)$$

↓

$$x_1 = (1.1054, 1.9292)$$

$$x_2 = (1.0784, 1.9260)$$