Contents

Problem 3 (20 points)

```
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%Created on Sep 25th, 2017
```

a. Collapse dendrite A and dendrite B into single cables and calculate their lengths, diameters and space constants

```
Gsoma =1e-9;

R_i =100*10^4;
% (i). Cable A
lambA = 500
dA1=1;
dA2=1;
dA = (dA1^(3/2)+dA2^(3/2))^(2/3)
RA = dA/2;
lA = 80+250
LA = lA/lambA;

GinfA = pi*RA^2/(R_i*lambA);
GinA = GinfA * tanh(LA);

% (ii). Cable B
lambB = 400
dB = 1
rB = 1/2*dB;
RB = rB;
lB = 600+600
LB = lB/lambB;

GinfB = pi*RB^2/(R_i*lambB);
GinB = GinfB * tanh(LB);
```

```
lambA =

   500


dA =

    1.5874
```

```
lA =

   330


lambB =

   400


dB =

     1


lB =

        1200
```

b. Calculate the total input resistance

```
G_total = Gsoma +GinA + GinB;
Rin = 1/G_total
```

```
Rin =

   1.9073e+08
```

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