## **Problems of the Week 5**

## Always show your work to receive credit (NO WORK=NO CREDIT)

1. A 550V power source provides energy to a load resistance  $R_L$  through a pair of copper ( $\rho$ =1.72x10<sup>-8</sup> $\Omega$ m) wires that are 20km long. The diameter of the wires is 3.0mm.

During a storm the current, I, supplied by the source increases and the voltage across  $R_L$  decreases. An engineer concludes that a fault has developed somewhere along the line and that there is a shunt resistance  $R_s$  at some distance x from the source. If the load resistance is disconnected, I is measured to be 3.8A. When the line terminals at the load are shorted, I is 7.2A. What is x (2pts)?

- A. 7.8km
- B. 17.9km
- C. 14.6km
- D. 2.1km

