**Worksheet 21 sound & intensity levels Name:**

Relevant textbook sections covered: 20.6

1) A foghorn is used to warn ships of the presence of other boats in [foggy](http://en.wikipedia.org/wiki/Fog) conditions.

The intensity of the foghorn is measured to be 1x10-3 W/m2 at a distance of 1 m. At sea, the minimum audible intensity is measured to be 1x10-8 W/m2 . What is the maximum distance at which the foghorn can be heard?

2) A parked car is playing music nearby. The sound level from the speaker to you, standing at a certain distance away from the car, is 60 dB. The driver now turns the volume up (because his favorite song came on), i.e., the power of the source is now increased. You are standing at the same spot and now detect the new sound level reaching you to be 90 dB.

The power of the source was increased by a factor of … ?

**GOOD PRACTICE**: Typically at the loudest volume setting (and unsafe for more than 5 mins of listening!) of an ipod has a sound level of 100 dB. Considering your earcanal is 0.35 mm long, what is the power of your ipod?

3) The Howler monkey is the loudest land mammal on Earth. At a distance of 5.0 m, the sound level of its grunts (“howls”) is measured to be 88.0 dB. The Howler can be heard up to a distance of 5.0 km. Assuming the acoustic output to be uniform in all directions,

(a) what is acoustic power emitted by the Howler monkey?

(b) Calculate the intensity of the sound at 5.0 km.

(c) WRITE a sentence COMPARING your prediction to your calculated value. (Think about the real world situation)