LAB QUIZ: SOUND LEVELS

AMBIENT NOISE (DB)	48.3		45.1		47.6	AMBIENT AVERAGE (DB)	

DISTANCE	SOUND LEVEL (DB)	DISTANCE	SOUND LEVEL (DB)	DISTANCE	SOUND LEVEL (DB)
1	67.7	7	56.2	13	53.9
2	63.1	8	55.8	14	54.1
3	60.9	9	55.7	15	53.3
4	58.7	10	54.7	16	53.2
5	58.2	11	54.7	17	52.7
6	56.7	12	54.1		

1. Calculate the average ambient background noise level. Express your answer with one decimal place.

2. For this data, about how loud is the ambient noise?
    A) Insulated broadcasting studio.
    B) Library.
    C) Suburban living room.
    D) Normal conversation.
    E) Pneumatic drill.

3. If you are standing outside on the corner of Oak Street and Harkrider at about 4:00 PM on a typical weekday, what noise level would you expect?
    A) 0—10 dB.
    B) 30—40 dB.
    C) 70—80 dB.
    D) 100—110 dB.

4. True or false: The graph of sound level as a function of distance is linear.

5. When you increase the distance from the source to the sound meter by a factor of 2 (i.e., from distance 1 to 2 or from distance 7 to 14), the volume of the sound
    A) doubles. The loudness increases by a factor of two.
    B) quadruples. The loudness increases by a factor of 2^2, or 4.
    C) does not change. Loudness does not depend on distance.
    D) halves. The loudness of the sound decreases to half its previous value.
    E) decreases, but the decrease between distances 1 and 2 is not the same as the decrease between distances 7 and 14!

6. Where would you expect to see the biggest *change* in sound level?
    A) Moving from distance 1 to distance 2.
    B) Moving from distance 8 to distance 9.
    C) Moving from distance 16 to distance 17.
    D) Trick question! The decibel level does not depend on how far from the source the sound meter is placed.

7. About how far from the source would you have to move before the sound level was reduced to the same level as the average background noise?
    A) At a distance of 1 or 2, the sound level is just above background.
    B) About halfway, so at a distance of 8 or 9, the sound level matches the average background noise.
    C) If the data stop at a distance of 17, that means the noise level will not change any further, so that must be the background level.
    D) If you extrapolate from the data, you will find that you have to move quite a long way from the source. In this case, you would have to go to a distance of about 50 before the level was at background.
    E) Infinity. And beyond. The sound meter will never reach the background level, no matter how far away.

8. True or false: As a person ages, they will naturally lose the ability to hear very high frequencies which are clearly audible to younger people.

9. According to the data table on the right, the people tested do not have the same maximum audible frequency. Which of these people would you guess is the oldest person in the group?
    A) Person 1 is probably the oldest.
    B) Person 3 is probably the oldest.
    C) Person 1 is probably the youngest, but you cannot really tell who of the remaining three is older.
    D) There is no way to determine who is older or younger just from testing how high a frequency they can hear. Any one of those people could be any age at all; there is no correlation between age and maximum audible frequency.

PERSON	MAXIMUM AUDIBLE FREQUENCY (HZ)
1	13,500
2	18,000
3	18,500
4	16,000

10. True or false: An anti-loitering device exists which emits a high frequency sound inaudible to most adults, but which can be heard by (and is annoying to) adolescents.