Name:

$\boxed{1\ pt}$ The speed of sound in air is 338 m/s. If an audible sound has a frequency of 12100 Hz, what is its wavelength in meters?

1.A◯ 1.09×10^{-2} **B**◯ 1.27×10^{-2} **C**◯ 1.49×10^{-2}
D◯ 1.74×10^{-2} **E**◯ 2.04×10^{-2} **F**◯ 2.39×10^{-2}
G◯ 2.79×10^{-2} **H**◯ 3.27×10^{-2}

$\boxed{1\ pt}$ Jill is listening to a horn. She knows the frequency of the horn is 300 Hz when both she and the horn are at rest. If she hears a pitch of 330 Hz, there are clearly several possibilities. Answer True or False to each staement below.

▷ Both can be moving and have different speeds.
2. **A**◯ True **B**◯ False

▷ Jill can be moving away from the horn which is at rest.
3. **A**◯ True **B**◯ False

▷ The horn can be moving towards the Jill who is at rest.
4. **A**◯ True **B**◯ False

$\boxed{1\ pt}$ A 1.30 kg mass on a spring oscillates horizontal frictionless surface. The motion of the mass is described by the equation:

$$x = 0.26\cos(3.15t)$$

In the equation, x is measured in meters and t in seconds. What is the maximum energy stored in the spring during an oscillation?
(in J)

5.A◯ 3.86×10^{-1} **B**◯ 4.36×10^{-1} **C**◯ 4.93×10^{-1}
D◯ 5.57×10^{-1} **E**◯ 6.29×10^{-1} **F**◯ 7.11×10^{-1}
**G**◯ 8.03×10^{-1} **H**◯ 9.08×10^{-1}

$\boxed{1\ pt}$ A steel piano wire, of length 0.650 m and mass 6.00 g is stretched under a tension of 490.0 N. What is the speed of transverse waves on the wire?
(in m/s)

6.A◯ 1.30×10^{2} **B**◯ 1.73×10^{2} **C**◯ 2.30×10^{2}
D◯ 3.06×10^{2} **E**◯ 4.08×10^{2} **F**◯ 5.42×10^{2}
G◯ 7.21×10^{2} **H**◯ 9.59×10^{2}

$\boxed{1\ pt}$ A 60 year old person has a threshold of hearing of 89.0 dB for a sound with frequency f=10,000 Hz. By what factor must the intensity of a sound wave of that frequency, audible to a typical young adult, (sound level=43.0 dB) be increased so that it is heard by the older person.

7.A◯ 1.69×10^{4} **B**◯ 2.25×10^{4} **C**◯ 2.99×10^{4}
D◯ 3.98×10^{4} **E**◯ 5.29×10^{4} **F**◯ 7.04×10^{4}
G◯ 9.37×10^{4} **H**◯ 1.25×10^{5}
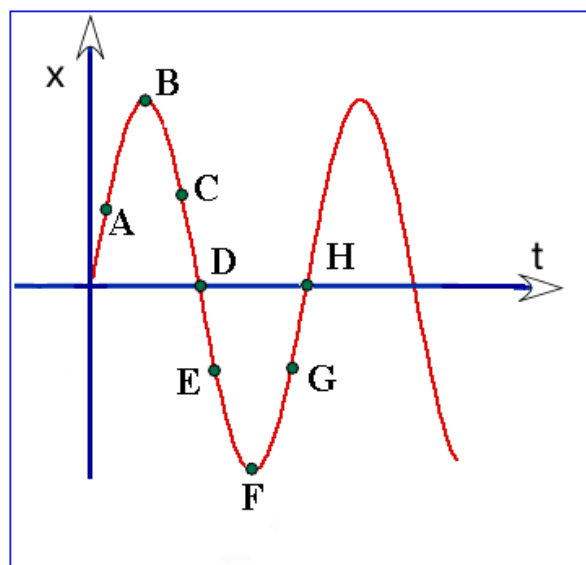
$\boxed{1\ pt}$
The curve represents an object in simple harmonic motion. Match the points on the curve to the velocity and acceleration of the object.

▷ The velocity is positive, and the acceleration is negative.
8. **A**◯ Point A **B**◯ Point B **C**◯ Point C
D◯ Point D **E**◯ Point E **F**◯ Point F
G◯ Point G **H**◯ Point H

▷ The velocity is zero, and the acceleration is positive.
9. **A**◯ Point A **B**◯ Point B **C**◯ Point C
D◯ Point D **E**◯ Point E **F**◯ Point F
G◯ Point G **H**◯ Point H

▷ The velocity is zero, and the acceleration is negative.
10. **A**◯ Point A **B**◯ Point B **C**◯ Point C
D◯ Point D **E**◯ Point E **F**◯ Point F
G◯ Point G **H**◯ Point H

▷ The velocity is negative, and the acceleration is zero.
11. **A**◯ Point A **B**◯ Point B **C**◯ Point C
D◯ Point D **E**◯ Point E **F**◯ Point F
G◯ Point G **H**◯ Point H