

Name _____

Date ____/____/____ Block: _____

Review Sheet for SHM, Waves, and Sound

1. If the period of a system in SHM is doubled, the frequency of the system is
 - a. doubled
 - b. halved
 - c. four times as large
 - d. $\frac{1}{4}$ as large
2. How does the speed of a mass in SHM change as the mass approaches the equilibrium position? Explain.
3. A 0.75 kg toy oscillating on a spring completes a cycle every 0.60 s. What is the frequency of this oscillation?
4. A particle in simple harmonic motion has a frequency of 40 Hz. What is the period of this oscillation?
5. What is the spring constant of a spring scale that stretches 6.0 cm when a basket of vegetables of mass 0.25 kg is suspended from it?
6. What mass on a spring with a spring constant of 100 N/m will oscillate with a period of 2.0 s?

7. A 0.50 kg mass oscillates in simple harmonic motion on a spring with a spring constant of 200 N/m.
- What is the period of the oscillation?

 - What is the frequency of the oscillation?
8. The simple pendulum in a tall clock is 0.75 m long.
- What is the period of the oscillation?

 - What is the frequency of the oscillation?
9. A water wave is
- transverse
 - longitudinal
 - a combination of transverse and longitudinal
 - none of the preceding
10. Standing on a hill and looking at a tall wheat field, you see a beautiful wave traveling across the field when there is a breeze. What type of wave is this?
11. A longitudinal sound wave has a speed of 340 m/s in air. If this wave produces a tone with a frequency of 1000 Hz, what is its wavelength?

12. A transverse wave has a wavelength of 0.50 m and a frequency of 20 Hz. What is the wave speed?
13. A student reading his physics book on a lake dock notices that the distance between two incoming wave crests is about 0.75 m, and he then measures the time of arrival between the crests to be 1.6 s. What is the approximate speed of the waves?
14. Light waves travel in a vacuum at a speed of 3×10^8 m/s. The frequency of visible light is about 5×10^{14} Hz. What is the approximate wavelength of light?
15. A sound wave with a frequency of 15 Hz is in what region of the sound spectrum?
a. audible b. infrasonic c. ultrasonic d. supersonic
16. A sound wave in air
a. is longitudinal c. has longitudinal and transverse components
b. is transverse d. travels faster than a sound wave through a liquid
17. The speed of sound is generally greatest in
a. solids b. liquids c. gasses d. a vacuum
18. Suggest a possible explanation of why some flying insects produce buzzing sounds and some do not.
19. The thunder from a lightning flash is heard by an observer 3.0 s after she sees the flash. What is the approximate distance to the lightning strike in (a) kilometers and (b) miles?

20. A guitar string makes 80 vibrations in one second. What is the period? What is the frequency?

21. A drum vibrates 180 times in 2 seconds. If the speed of sound is 340 m/s, what is the period, frequency and wavelength of the waves produced by the drum?

22. The speed of light is 3×10^8 m/s. If blue light has a frequency of 6×10^6 Hz, what is the period and wavelength of blue light?

23. A butterfly flaps its wings 100 times in 10 seconds. What is the period and frequency? If the speed of sound is 340 m/s, what is the wavelength of the sound waves produced?

24. A 10 m long rope is used to create standing waves. If the rope makes 240 vibrations in one minute, what is the period and frequency of the waves? If the waves are traveling 12 m/s, what is the wavelength of the waves and how long does it take a single wave to travel from one end of the rope to another?