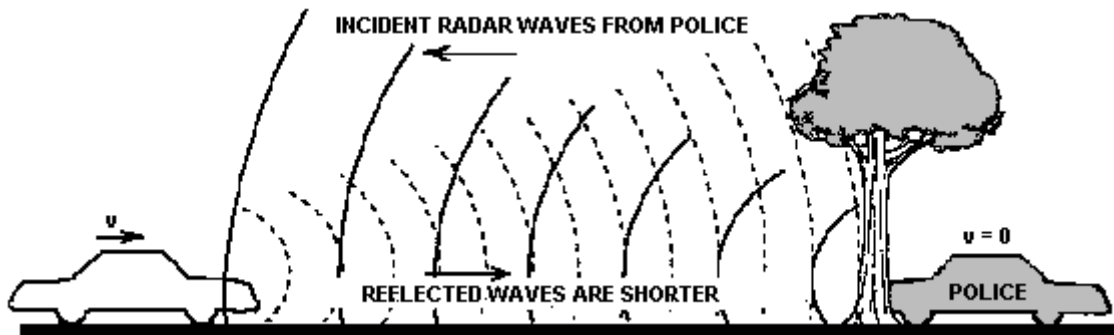


Periodic Wave Phenomena

Name: _____

1.

The diagram shows radar waves being emitted from a stationary police car and reflected by a moving car back to the police car.



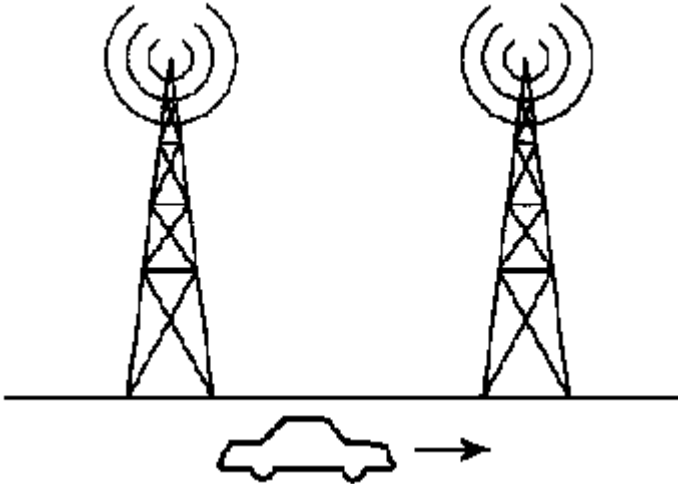
The difference in apparent frequency between the incident and reflected rays is an example of

1. constructive interference
2. refraction
3. the Doppler effect
4. total internal reflection

Periodic Wave Phenomena

2.

A car radio is tuned to the frequency being emitted from two transmitting towers. As the car moves at constant speed past the towers the sound from the radio repeatedly fades in and out.

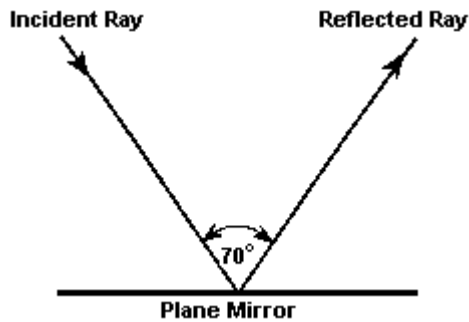


This phenomenon can best be explained by

- 1. refraction
- 2. interference
- 3. reflection
- 4. resonance

3.

The diagram represents a light ray being reflected from a plane mirror. The angle between the incident ray and the reflected ray is 70° .



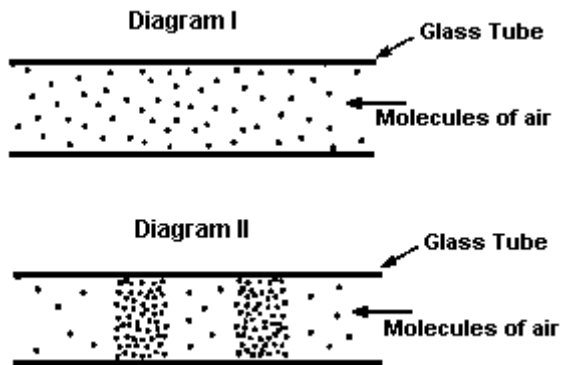
What is the angle of incidence for this ray?

- 1. 20°
- 2. 35°
- 3. 55°
- 4. 70°

Periodic Wave Phenomena

4.

Diagram I shows a glass tube containing undisturbed air molecules. Diagram II shows the same glass tube after a wave passes through it.



Which type of wave produced the disturbance in Diagram II?

1. longitudinal
2. torsional
3. transverse
4. elliptical

5.

A police officer's stationary radar device indicates that the frequency of the radar wave reflected from an automobile is less than the frequency emitted by the radar device. This indicates that the automobile is

1. moving toward the police officer
2. moving away from the police officer
3. not moving

6.

A periodic wave with a frequency of 10 hertz would have a period of

1. 1 s
2. 0.1 s
3. 10 s
4. 100 s

7.

The spreading of waves into the region behind an obstacle is known as

1. diffusion
2. dispersion
3. refraction
4. diffraction

Periodic Wave Phenomena

8.

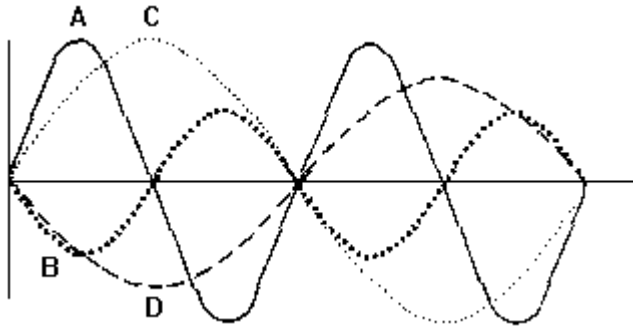


Figure 1

Which two wave representations in the diagram have the same amplitude?

1. A and C
2. A and D
3. B and D
4. C and D

9.

The number of water waves passing a given point each second is a measure of the wave's

1. wavelength
2. amplitude
3. frequency
4. velocity

10.

The speed of a transverse wave in a string is 12 meters per second. If the frequency of the source producing this wave is 3 hertz, what is its wavelength?

1. 0.25 m
2. 2 m
3. 36 m
4. 4 m

11.

Refraction of a wave is caused by a change in the wave's

1. amplitude
2. frequency
3. phase
4. speed

Periodic Wave Phenomena

12.

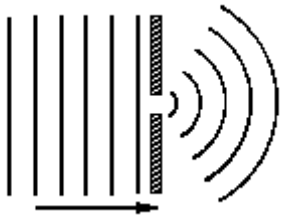


Figure 2

Which wave phenomenon is represented in the diagram?

1. refraction
2. diffraction
3. reflection
4. interference

13.

Maximum constructive interference between two waves of the same frequency could occur when their phase difference is

1. 1λ
2. $\frac{1}{2}\lambda$
3. $\frac{3}{2}\lambda$
4. $\frac{1}{4}\lambda$

14.

Electromagnetic radiation would be classified as

1. a torsional wave
2. a longitudinal wave
3. a transverse wave
4. an elliptical wave

Periodic Wave Phenomena

15.

Two waves of the same wavelength (λ) interfere to form a standing wave pattern as shown in the diagram.



What is the straight-line distance between consecutive nodes?

1. 1λ
2. 2λ
3. $\frac{\lambda}{2}$
4. $\frac{\lambda}{4}$

16.

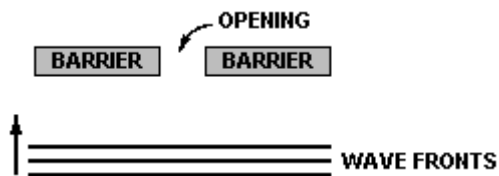
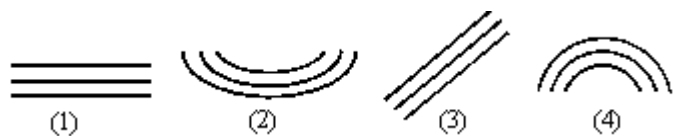


Figure 3

The diagram above represents straight wave fronts approaching an opening in a barrier. Which diagram below best represents the shape of the waves after passing through the opening?



17.

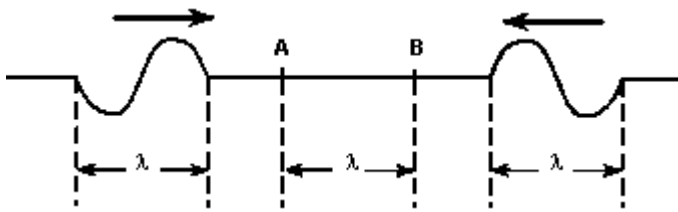
A characteristic common to sound waves and light waves is that they

- | | |
|---------------------|-----------------------|
| 1. are longitudinal | 3. transfer energy |
| 2. are transverse | 4. travel in a vacuum |

Periodic Wave Phenomena

18.

The diagram shows two pulses, each of length λ , traveling toward each other at equal speed in a rope.

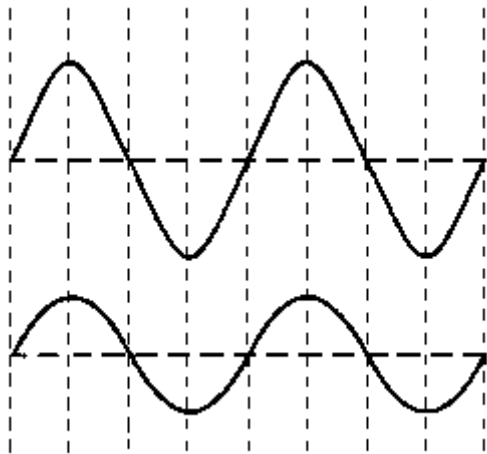


Which diagram below best represents the shape of the rope when both pulses are in region AB?

- (1)
- (2)
- (3)
- (4)

19.

The diagram shows two waves traveling in the same medium for the same length of time.



The two waves have different

- 1. amplitudes
- 2. frequencies
- 3. speeds
- 4. wavelengths

Periodic Wave Phenomena

20.

The periodic wave in the diagram has a frequency of 40. hertz.

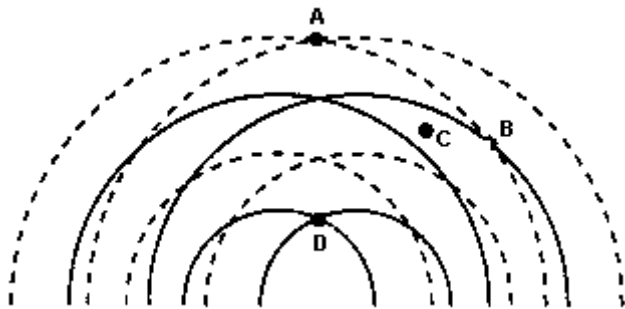


What is the speed of the wave?

1. 13 m/s
2. 27 m/s
3. 60. m/s
4. 120 m/s

21.

Two wave sources operating in phase in the same medium produce the circular wave patterns shown in the diagram. The solid lines represent wave crests and the dashed lines represent wave troughs.



Which point is at a position of maximum destructive interference?

1. A
2. B
3. C
4. D

22.

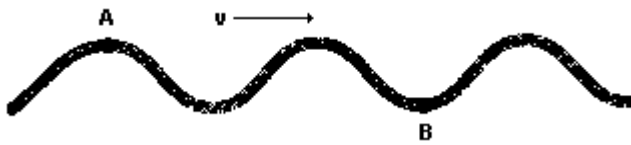
Two points in a transverse wave that have the same magnitude of displacement from equilibrium are in phase if the points also have the

1. same direction of displacement and the same direction of motion
2. same direction of displacement and the opposite direction of motion
3. opposite direction of displacement and the same direction of motion
4. opposite direction of displacement and opposite direction of motion

Periodic Wave Phenomena

23.

A periodic wave travels through a rope, as shown in the diagram.

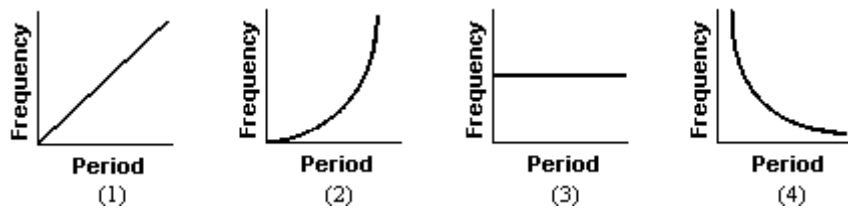


As the wave travels, what is transferred between points *A* and *B*?

- | | |
|-----------------|----------------------------|
| 1. mass, only | 3. both mass and energy |
| 2. energy, only | 4. neither mass nor energy |

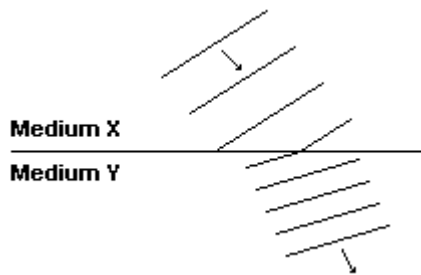
24.

Which graph best represents the relationship between the frequency and period of a wave?



25.

The diagram represents wave fronts traveling from medium *X* into medium *Y*.



All points on any one wave front shown must be

- | | |
|----------------------------------|---------------|
| 1. traveling with the same speed | 3. in phase |
| 2. traveling in the same medium | 4. superposed |

Periodic Wave Phenomena

Answer Key for Periodic Wave Phenomena

1. 3
2. 2
3. 2
4. 1
5. 2
6. 2
7. 4
8. 1
9. 3
10. 4
11. 4
12. 2
13. 1
14. 3
15. 3
16. 4
17. 3
18. 4
19. 1
20. 3
21. 2
22. 1
23. 2
24. 4
25. 3