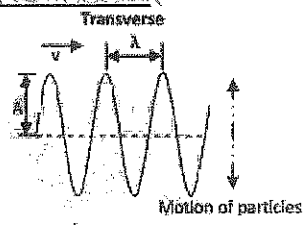
Skill 49: Describing Waves by Cycle

74. One complete oscillation is known as a wave cycle which can be considered 360° **degrees.**

75. Transverse Motion (Vibration) - the vibration and the propagation of energy are perpendicular



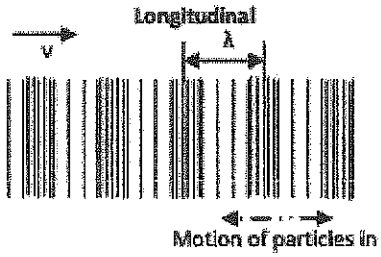
All EM waves are transverse

Some mechanical waves are transverse.

High point of a transverse wave is known as a crest

Low point of a transverse wave is known as a trough

76. **Longitudinal Motion** (Vibration)– The vibration and the propagation of energy are parallel



Some mechanical waves are longitudinal

Ex: Sound, Earthquake p-waves etc

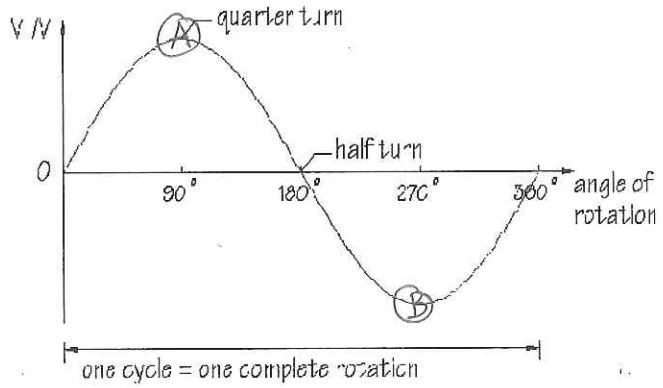
The area where the wave is "squeezed" together is known as a compression

The area where the wave is "stretched" apart is known as rarefaction

77. For either type of wave – longitudinal or transverse

A cycle can be broken down into 4 parts each representing 90° **degrees each**

78. Cycles are easier to represent in transverse waves. On the image below indicate by placing an A and B on the wave indicating positions ½λ out of phase.

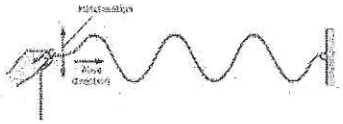


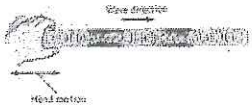
79. Waves are described by the type particle vibration. The two main types of particle motion are (define each)

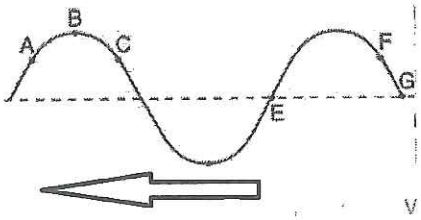
a. **Transverse** – propagation perpendicular to particle motion

b. **Longitudinal** – propagation parallel to particle motion

80. Label the following as Longtidunal or Transverse and then label crest/trough or compression/rarefaction as appropriate.


transverse


longitudinal



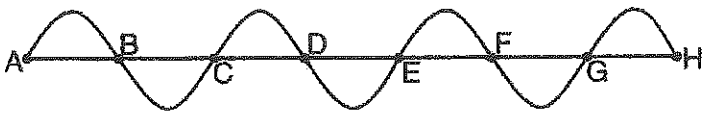
81. Which two points are "in phase"?
C & F

82. What is the phase difference between points A and C? 90°

83. As the wave passes through point "C" its immediate motion will be down
(a trough is approaching)

Topic 6B: Wave Cycle and Phase
Skill 49

84. The diagram below represents a periodic wave.

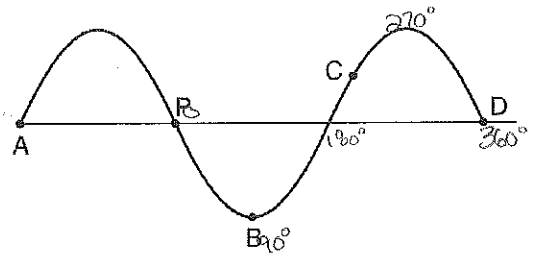


Which two points on the wave are out of phase?

A) *A* and *C* (1λ in phase) B) *B* and *F* (2λ in phase) C) *C* and *E* (1λ in phase) D) *D* and *G* (1.5λ out of phase)

If wave moved to left D is on downward phase & G is on upward phase

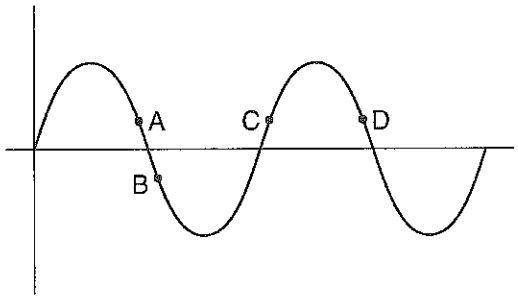
85. The diagram below represents a periodic wave.



Which point on the wave is 90° out of phase with point *P*?

A) *A* B) *B* C) *C* D) *D*

86. The diagram below shows a periodic wave.



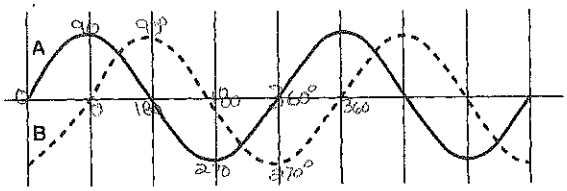
Which points are in phase with each other?

A) *A* and *C* B) *A* and *D*

C) *B* and *C* D) *C* and *D*

If wave moving left A is on downward and D is downward for same time line

87. The diagram below shows two waves, *A* and *B*.



The phase difference between *A* and *B* is

A) 0° B) 45° C) 90° D) 180°

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

A) same direction of displacement and the same direction of motion

B) same direction of displacement and the opposite direction of motion

C) opposite direction of displacement and the same direction of motion

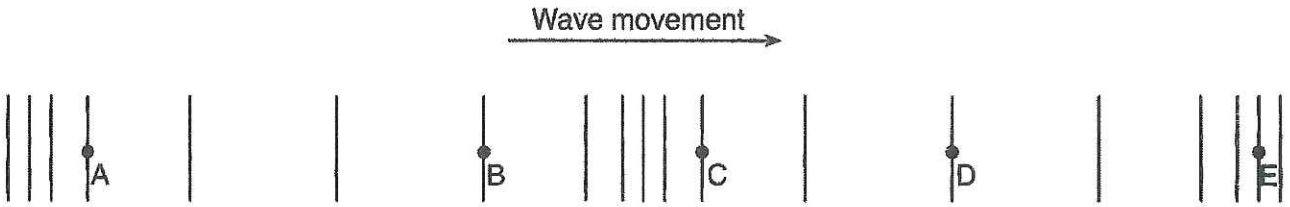
D) opposite direction of displacement and the opposite direction of motion

Topic 6B: Wave Cycle and Phase

89. Base your answer to the following question on the information and diagram below.

A longitudinal wave moves to the right through a uniform medium, as shown below.

Point *A*, *B*, *C*, *D*, and *E* represent the positions of particles of the medium

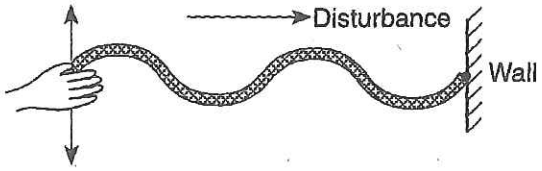


The energy of this wave is related to its

A) amplitude B) period C) speed D) wavelength

requires a medium so energy associated with amplitude

90. The diagram below shows a person shaking the end of a rope up and down, producing a disturbance that moves along the length of the rope.

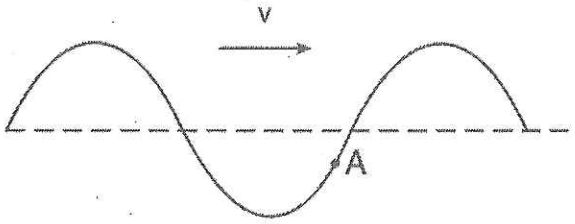


Which type of wave is traveling in the rope?

A) torsional B) longitudinal
C) transverse D) elliptical

propagation → ⎫ perpendicular
vibration ↕ ⎭

91. The diagram below represents a transverse wave traveling to the right through a medium. Point A represents a particle of the medium.



In which direction will particle A move in the next instant of time?

A) up B) down
C) left D) right

Trough approaching

92. As a transverse wave travels through a medium, the individual particles of the medium move

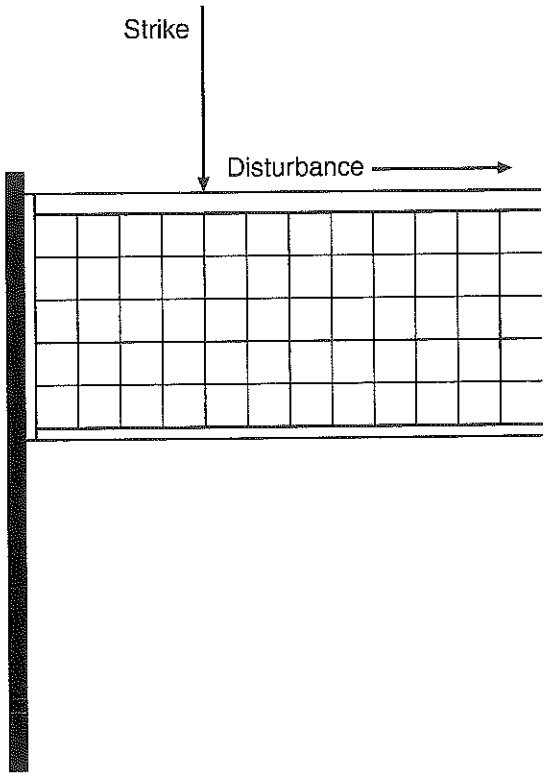
A) perpendicular to the direction of wave travel
B) parallel to the direction of wave travel
C) in circles
D) in ellipses

93. An earthquake is traveling from the west to east through rock. If the particle are vibrating in a north-south direction, the wave must be classified as

A) transverse
B) longitudinal
C) a microwave
D) a radio wave

Propagational Earthquake west to east ↔
Particle vibration North/South ↕
ie perpendicular

94. A student strikes the top rope of a volleyball net, sending a single vibratory disturbance along the length of the net, as shown in the diagram below.



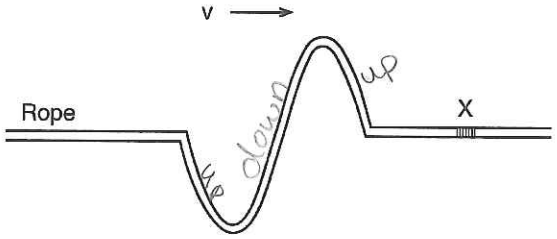
This disturbance is best described as

A) a pulse
B) a periodic wave
C) a longitudinal wave
D) an electromagnetic wave

Single disturbance is a pulse

Topic 6B: Wave Cycle and Phase

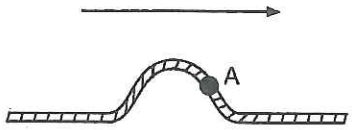
95. As shown in the diagram below, a transverse wave is moving with velocity v along a rope.



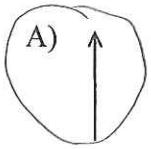
In which direction will segment X move as the wave passes through it?

A) down, only
B) up, only
C) down, then up, then down
D) up, then down, then up

96. The diagram below shows a pulse moving to the right in a rope A is a point on the rope.



Which arrow best shows the direction of movement of point A at this instant?

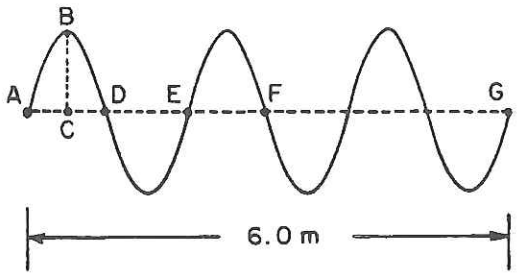
A) 

B) 

C)

D) 

97. Base your answer to the following question on the diagram below which represents a vibrating string with a periodic wave originating at A and moving to G a distance of 6.0 meters.



What type of wave is represented by the diagram?

A) elliptical
B) longitudinal
C) torsional
D) transverse

98. When a transverse wave is moving through a medium, what is the action of the particles of the medium?

A) They travel through the medium with the wave.
B) They vibrate in a direction parallel to the direction in which the wave is moving.
C) They vibrate in a direction perpendicular to the direction in which the wave is moving.
D) They remain at rest.