

1. The main difference between a capillary wave and a gravity wave is
 - a) capillary waves are produced by wind whereas gravity waves are produced by undersea earthquakes.
 - b) capillary waves have wind as their disturbing force, whereas gravity waves have gravity as their disturbing force.
 - c) capillary waves are never longer than 1 cm whereas gravity waves can have any length, up to 200 km.
 - d) capillary waves can have a wave height greater than 1/7 of the wavelength, whereas gravity waves cannot.
 - e) capillary waves get their restoring force from surface tension/cohesion whereas gravity waves get their restoring force from gravity.

2. A wave passes by you going 8 m/s. 8 seconds later the next wave goes by at the same speed. What do you know about the wavelength?
 - a) The wavelength is 1 meter.
 - b) The wavelength is 3.54 meters.
 - c) The wavelength is 40.9 meters
 - d) The wavelength is 64 meters.
 - e) There is not enough information to determine it.

3. A wave having a length of 40 meters goes by you. The water is 1.5 meter deep. What is the wave speed?
 - a) 0.038 m/s
 - b) 3.8 m/s
 - c) 7.9 m/s
 - d) 27 m/s
 - e) Not enough information is given.

4. A wave having a length of 40 meters goes by you. The water is 30 meters deep. What is the wave speed?
 - a) 0.75 m/s
 - b) 1.3 m/s
 - c) 7.9 m/s
 - d) 17 m/s
 - e) Not enough information is given.

5. The first waves to form on the ocean surface when the wind starts to blow are
 - a) gravity waves.
 - b) internal waves.
 - c) capillary waves.
 - d) swell.

6. The main factors affecting the growth of wind waves are
 - a) wind speed, wind direction, and water depth.
 - b) wind speed, wind direction, and wind duration.
 - c) wind speed, wind direction, and fetch (distance over which the wind blows).
 - d) wind speed, wind duration, and fetch.
 - e) wind speed, fetch, and water depth.

7. As wind waves move away from the storm area where they were generated,
 - a) the shortest waves move out first and form "chop."
 - b) The longest waves leave first, but the short waves outrun them.
 - c) the longest waves outrun the shortest waves, creating "swell" far from the storm.
 - d) the sea flattens out everywhere as soon as the storm is over.

8. The maximum height of a wind wave during its formation is approximately ____ the wavelength
- 4/3
 - 3/4
 - 7 times
 - 1/7
 - 2 times
9. A fully developed sea is one in which
- developers have bought up all the shore front property and built mansions and condominiums.
 - the major salts stay constant and salt input equals salt removal.
 - the waves are as big as they are going to get for a given set of wind conditions.
 - the wind has blown for no fewer than 69 hours at 92 km/hr (58 miles/hr).
 - Capillary waves have fully developed into gravity waves.
10. Constructive interference of different wave trains can result in
- waves bending to become parallel to shore.
 - waves turning to run perpendicular to shore.
 - waves radiating out from a gap in a breakwater.
 - huge rogue waves appearing out of nowhere.
11. When waves approach a shore
- the wavelength increases.
 - the period increases.
 - the average wave height decreases.
 - the waves slow down and build in height.
 - the waves speed up and build in height.
12. Approaching the shore, waves with a wavelength of 200 feet will start to "feel" the bottom when the depth is about
- 20 feet.
 - 50 feet.
 - 100 feet.
 - 200 feet.
 - 400 feet.
13. Waves approaching a shore start to break when
- water depth is about twice wavelength.
 - the crests flatten into a rounded form.
 - the wave period increases to about 15 seconds.
 - the wave height is about three fourths the water depth.
14. If the bottom is steeply sloping, waves approaching the shore
- will typically form plunging waves.
 - will typically form spilling waves.
 - will always be "closed out" (a surfing term meaning they tend to break all at once).
 - will never be "closed out."
15. Surfers say "the point draws the waves," meaning that waves seem to focus on a point of land (see Figure 12.6 for an example). This is a demonstration of what wave phenomenon?
- Constructive interference
 - Destructive interference
 - Refraction
 - Diffraction
 - Reflection

16. Which of the following statements about internal waves is false?
- Internal waves form at the interface between water layers of different density.
 - Internal waves move much faster than waves on the surface of the ocean.
 - Internal waves can have wave heights as tall as 100 feet.
 - Internal waves may be able to destroy submarines.
17. Storm surges are
- regular phenomena generated by global wind patterns.
 - associated with all atmospheric storms.
 - surging currents caused earthquakes, landslides, or icebergs breaking off glaciers.
 - associated with the low pressure center of a powerful cyclonic storm.
 - interesting scientifically, but not much danger to people.
18. A seiche is a wave
- that can only be generated by seismic activity, and travels at over 400 miles per hour.
 - which is observed as water sloshing back and forth in an enclosed basin.
 - found only underwater at the interface between two water bodies.
 - generated by a hurricane.
19. The Lake Geneva seiche has a wavelength of
- 1/2 the length of the lake.
 - the length of the lake.
 - twice the length of the lake.
 - 10 times the length of the lake.
 - not related in any way to the length of the lake.
20. A tsunami is different from a regular ocean wave in the deep ocean in that
- a tsunami is generated by hurricane force winds and is a shallow-water wave, whereas a regular ocean wave is generated by normal winds and is a deep-water wave.
 - a tsunami is generated by earthquakes or landslides and is a shallow-water wave, whereas a regular ocean wave is generated by normal winds and is a deep-water wave.
 - a tsunami is generated by hurricane force winds and is a deep-water wave, whereas a regular ocean wave is generated by normal winds and is a deep-water wave.
 - a tsunami is generated by earthquakes or landslides and is a deep-water wave, whereas a regular ocean wave is generated by normal winds and is a deep-water wave.
21. Which of the following is true about a tsunami?
- A tsunami can travel at more than 400 miles per hour, and appears to ships at sea as a 30-meter tall mountain of water.
 - A tsunami can travel at more than 400 miles per hour, but may pass unnoticed by ships at sea.
 - A tsunami can travel at more than 400 miles per hour, and appears to ships at sea as a plunging breaker 20 meters tall.
 - A tsunami travels slowly across the ocean, but accelerates as it reaches land, turning into a breaker 20 meters tall.
 - A tsunami travels across the ocean at more than 400 miles per hour, but doesn't turn into a 20-meter tall plunging breaker until it reaches shore.
22. Sketch a waveform. Indicate in your sketch 1) the wavelength, 2) the wave height.
23. What is the relationship between wave speed, wavelength, and wave period? Use this relationship to solve the following:
- A wave with a period of 5 s and a wavelength of 15 m goes how fast?
 - A wave with a speed of 5 m/s and a period of 10 s has what wavelength?
24. Explain to your grandmother why waves break at a certain distance from the shore. What are the different types of breakers?

25. Explain what a rogue wave is.
26. Explain why surfers say “The point draws the waves.”
27. Explain to your grandmother what a tsunami is, and how it differs from other waves. How will it appear to ships at sea, and to people on land?