Musical Acoustics Homework Due January 26.
You may work together, but everyone should turn in a separate homework.

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BULLETIN
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1133 AM HST SAT FEB 27 2010
TO - CIVIL DEFENSE IN THE STATE OF HAWAII
SUBJECT - TSUNAMI WARNING SUPPLEMENT
AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAM-
ETERS
      ORIGIN TIME - 0834 PM HST FRI 26 FEB 2010
      COORDINATES - 36.1 SOUTH   72.6 WEST
      LOCATION    - NEAR COAST OF CENTRAL CHILE
      MAGNITUDE   - 8.8  MOMENT
EVALUATION
A TSUNAMI HAS BEEN GENERATED THAT COULD CAUSE DAMAGE
ALONG COASTLINES OF ALL ISLANDS IN THE STATE OF HAWAII.
URGENT ACTION SHOULD BE TAKEN TO PROTECT LIVES AND PROP-
ERTY.
A TSUNAMI IS A SERIES OF … OCEAN WAVES. EACH INDIVIDUAL
WAVE CREST CAN LAST 5 TO 15 MINUTES OR MORE AND EXTEN-
SIVELY FLOOD COASTAL AREAS. … TSUNAMI WAVES EFFICIENTLY
WRAP AROUND ISLANDS.
ALL SHORES ARE AT RISK NO MATTER WHICH DIRECTION THEY
FACE. THE TROUGH OF A TSUNAMI WAVE MAY TEMPORARILY EX-
POSE THE SEAFLOOR BUT THE AREA WILL QUICKLY FLOOD AGAIN.
EXTREMELY STRONG AND UNUSUAL NEARSHORE CURRENTS CAN AC-
COMPANY A TSUNAMI.
THE ESTIMATED ARRIVAL TIME IN HAWAII OF THE FIRST TSU-
NAMI WAVE IS
      1105 AM HST SAT 27 FEB 2010
MESSAGES WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS
WARRANT.
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1 The warning states that tsunami waves efficiently wrap around islands. What can you say about the wavelength of a tsunami wave relative to the diameter of the islands? Explain your reasoning (with a picture, if helpful).

2 The island of Hawaii has a diameter of roughly 100 miles. What must the wavelength of the tsunami wave be, expressed as an inequality?

3 Based on the facts given above (including the bulletin), what is the approximate speed of propagation of a tsunami wave? You will need to look up the distance between Chile and Hawaii.

[redacted]

5 The largest tsunami ever recorded, over 500 meters high*, occurred in Lituya Bay, Alaska when an earthquake caused a massive landslide into the bay. The bay is about 10 miles long and 2 miles wide, with a narrow opening to the sea. Why would these conditions lead to an unusually large tsunami? According to one survivor on a boat that rode out the quake, the wave may in the bay have been traveling up to 600 mph.
* 520 meters - 1720 feet - was the "runup" onto the steep shoreline walls. The wave may have been 200 feet high in the center of the bay, it is estimated.