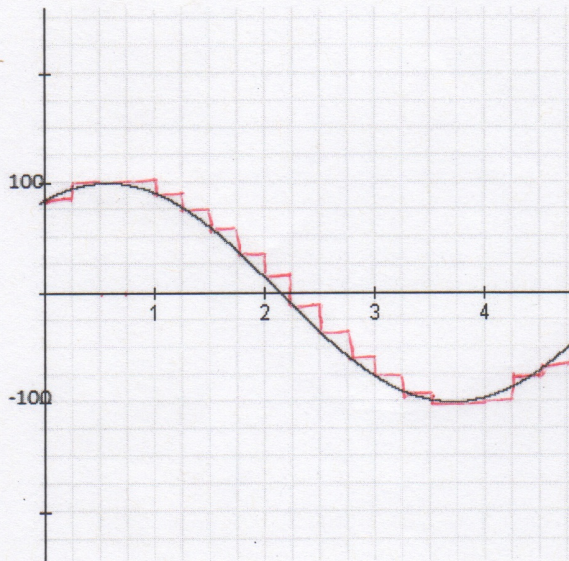


1. (8 points, total) Consider the illustrated curve below. Quantize this data by drawing boxes on the curve (2 points). Sample the data every fourth of a second, and only allow voltage values that are a multiples of 10 volts.



- (a) (2 point) How many times a second will you sample data? What is your sampling rate, in Hertz? *4 times a second, 4 Hz*
- (b) (2 point) Enumerate the different values you will need to do this (such as, you will need 0 volts and 10 volts and -10 volts, and what else? How many bits would you need to represent that many quantities?
-100, -90, -80, -70, -60, -50, -40, -30, -20, -10, 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
21 values => 5 bits
- (c) (2 points) What bit-rate would you need to transmit this data as it is collected?
 $4 \times 5 = 20$
2. (2 points) Fill in the parity bit for each line in the right hand column. You can use either even or odd parity as long as you are consistent (1 point). In the bottom row, fill in the checksum for all 6 transmitted bytes (1 point).

Original Data	E	odd
10000000	1	0
01011011	1	0
00000000	0	1
11111111	0	1
01010101	0	1
01001001	1	0
E 00111000		
Odd 11000111		