occur within the period of the signal's highest frequency sinusoid. In these ways, the sampling signal captures the sampled signal's temporal variations in a way that leaves all the original signal's structure intact.



is not high enough, what signal would your resulting undersampled

signal become?

What is the simplest bandlimited signal? Using this signal, convince yourself that less than two samples/period will not suffice to specify

it. If the sampling rate

**Exercise 5.3.3**

### Amplitude Quantization

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The Sampling Theorem says that if we sample a bandlimited signal s (t) fast enough, it can be recovered without error from its samples **s (nTs), n ∈{..., −1, 0, 1,... }.** Sampling is only the frst phase of acquiring data into a computer: Computational processing further requires that the samples be **quantized**: analog values are converted into digital (Section 1.2.2: Digital Signals) form. In short, we will have performed **analog-to-**

###### digital (A/D) conversion.