Final Exam hints

A signal-to-noise ratio of unity (S/N=1) is by definition simply noise. The minimum S/N to be considered as a detection is 3. A S/N of 5 or 10 is a more standard goal in a proposal for emphasizing that the plan is to obtain secure detections.

Rule-of-thumb: increasing the integration time by a factor of β yields an increase in S by a factor of β and an increase in N by a factor of sqrt(β), and thus an increase in S/N by a factor of sqrt(β). Thus, to double the S/N, you need to quadruple the integration.
→ This rule-of-thumb doesn't apply for non-linear responses or situations that are limited by 'systematics' (e.g., flat-fielding, readout noise, etc.).

The noise in a spectrum can be estimated by the standard deviation in the continuum level; $\pm 1\sigma$ (or a 2σ width) encompasses 68.3% of the data points for a normal distribution.

Example:
Suppose the observatory staff tell you that a source of flux X observed for time Y yields S/N=Z → [f=X,t=Y,S/N=Z]
Furthermore, suppose your source flux is B. This translates the above combination to [f=B,t=Y,S/N=sqrt(B/X)Z].
But suppose your targeted S/N is C not sqrt(B/X)Z. In that case, we have [f=B,t=Y(C/(sqrt(B/X)Z))^2,S/N=C].

Note: For most galaxy spectra, FIR is ~ ½TIR.