1-5)

Each ship emits light of wavelength 200 nm.

A sees B’s emission at 180 nm

B sees C’s emission at 165 nm.

First, we need to find the velocities of the ships. We already have the Doppler relationship for receding sources.

For B as seen from A,

The negative sign indicated that B is approaching A, or vice versa.

For C as seen by B,

The negative sign indicated that C is approaching B, or vice versa.

Now, find the speed of C as seen by A:

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Then,