A Navigation Problem

The goal of celestial navigation is to find your position on the Earth (your latitude and longitude). This requires two separate steps:

A) Finding your latitude: You need a sextant

You should be able to say ***VERY QUICKLY*** how you find your latitude from the stars, particularly in the northern hemisphere.

B) Finding your longitude: You need a sextant, a clock, and an ephemeris

An ephemeris is a list of the rising and setting times of bright stars for each day of the year. This will allow you to find out the difference in longitude between the longitude (time zone) of your clock, and your current longitude, using the same logic as you did for finding the difference between solar noon and civil noon for various locations.

Determine your position from the following data:

a) With your sextant you sight Polaris at an altitude of 18° above your northern horizon.

b) You observe the transit of Vega at 12:12 AM on July 1, according to a clock set for New York (EDT).

c) You look up the transit time of Vega on July 1 on p. 13 of the battered old *Field Guide to the Stars and Planets* that you've carried since your astronomy days at St. Lawrence, and use it to figure out your position east or west of 75°W (the center of the Eastern Time Zone).

Follow the steps for figuring it out:

Altitude of Polaris _____ **Latitude of ship** _____

Observed transit of Vega _____ **Expected Transit of Vega** _____

Time difference between the observed and expected transit:

_____ hours _____ minutes Early? Late? (circle one)

Longitude difference from time zone center _____ degrees East? West?

Time zone center _____ **Longitude of ship:** _____

Room to write out your calculations! (to study from!)

Where are you (Use an atlas!)?