2025A2 AIR PRESSURE

Level 1: Remember that air molecules travel from high pressure to low pressure. Using that information, region B is most likely experiencing the most wind. It is in between the high and low areas and the isobars are closer together in that area.

Level 2: First, let's find the morning pressure for Turbine B. Using the values given in the question plug them into the equation from the text above.

$$P_h = P_0 e^{-gMh/RT}$$

Morning pressure for Turbine B:

$$P_h = 101352.9 \times e^{-9.8\times0.0289\times50/(8.314\times288.70)} = 100753.1\ Pa$$

Next, isolate the h in the formula and plug in the relevant data.

$$P_h = P_0 e^{-gMh/RT}$$

$$P_h/P_0 = e^{-gMh/RT}$$

$$\ln(P_h/P_0) = \ln e^{-gMh/RT}$$

$$\ln(P_h/P_0) = -gMh/RT \times \ln e$$

$$\frac{\ln(P_h/P_0)}{\ln e} = -gMh/RT$$

$$\frac{\ln(P_h/P_0)}{\ln e} \times (RT) = -gMh$$

$$\left(\frac{\ln(P_h/P_0)}{\ln e} \times (RT)\right) \Big/ (-gM) = h$$

$$\left(\frac{\ln(100063.6\ /101352.9)}{\ln e} \times (8.314 \times 288.70)\right) \Big/ (-9.8 \times 0.0289) = 108\ m$$

The height of Turbine A is 108 meters.