University of British Columbia, Vancouver
GEOS 300 - Microscale Weather and Climate
Knox

Study Questions - Lecture 18

1. During an hour, you measure air temperature T every 10 minutes according the table below. Calculate the following terms:

Minutes	T
10	12.6°C
20	11.2°C
30	11.9°C
40	13.1°C
50	12.0°C
60	11.8°C

   (a) $\overline{T}$

   (b) T' at 40 min

   (c) T'^2 at 20 min

   (d) $\overline{T'}$

   (e) $\overline{T'^2}$

   (f) $\overline{T'}^2$

2. Simplify the following terms. T is temperature, p is pressure, q is absolute humidity, u, v, w are the longitudinal, lateral and vertical wind components.

   (a) $\overline{5}$

   (b) $\overline{8v}$

   (c) $\overline{\overline{T}\overline{p}}$

   (d) $\overline{\overline{u}}$

   (e) $\overline{q'}$

   (f) $\overline{T'} \times \overline{w}$

   (g) $\overline{3q'}$

   (h) $\overline{w' \times \overline{u}}$

   (i) $\overline{\overline{T}p}$

   (j) $\overline{wT}$

3. Calculate the following parameters if $\overline{u} = 4\,\mathrm{m\,s^{-1}}$, $\overline{v} = 0\,\mathrm{m\,s^{-1}}$, $\overline{w} = 0\,\mathrm{m\,s^{-1}}$, $\sigma_u = 0.4\,\mathrm{m\,s^{-1}}$, $\sigma_v = 0.2\,\mathrm{m\,s^{-1}}$, and $\sigma_w = 0.1\,\mathrm{m\,s^{-1}}$.

   (a) I_u

   (b) I_w

   (c) $\overline{w'^2}$

   (d) $\overline{u'^2} + \overline{v'^2} + \overline{w'^2}$

   (e) MKE/m

   (f) $\overline{e}$