

Homework 2 Due: 02/08/2016

Applied Transport Phenomena - CHME420

Exercise 1. List the steps necessary to derive models of flowing systems via the shell balance procedure.

Exercise 2. The Reynolds number for the different systems studied in Chapter 2 is defined differently. How can this be the case? What is the general definition of the Reynolds number?

Exercise 3. What does the integral:

$$\int_0^{2\pi} \int_0^R v_z r \, dr \, d\theta$$

calculate? Can you tell the coordinate system? If so, what is it?

Exercise 4. What does the integral:

$$\int_0^{2\pi} \int_0^\pi (\tau_{r\theta}|_{r=R}) R^2 \sin \theta \, d\theta \, d\phi$$

compute? Can you tell the coordinate system? If so, what is it? Why is it necessary to include $R^2 \sin \theta$?

Exercise 5. What does the expression:

$$\frac{\int_0^{2\pi} \int_0^R T(r) r \, dr \, d\theta}{\int_0^{2\pi} \int_0^R r \, dr \, d\theta}$$

compute? Can you tell the coordinate system? If so, what is it?

Exercise 6. BSL 2A.1

Exercise 7. BSL 10A.1

Exercise 8. BSL 2B.3 parts a to d

Exercise 9. BSL 2B.7 parts a to c

Exercise 10. BSL 10B.1 parts a to c