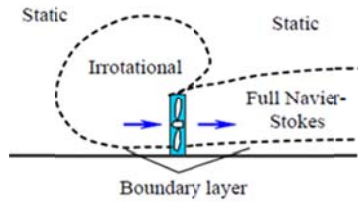# Problem set #6 - Answers

## ME 231-A

1. 4.10 m/s.

2. 

3. $x = 2$ m.

4. (a) $U_2 = U_1 - (P_2-P_1)/(\rho U_1)$ (b) 10.1 m/s.

5. $H = 1$.

6. (a) and (b) 2.12 m/s.

7. 26 mm

8. (a) $\delta/6$ (b) $\delta/x = 3.46/(Re_x^{0.5})$

9. (a) $F_{total} = 2.656 N^2 (\rho\mu L)^{0.5} U^{1.5} a$; (b) $\Delta p_{array} = 2.656(\rho\mu L)^{0.5} U^{1.5}/a$

10. 25500 Pa.

11. 5300 N

12. $C_D = 0.29$

13. $F_D = 475$ N; $F_L = 333$ N

14. Moment = 0.113 Nm

15. $a = 1.63$ m/s$^2$

16. $F_{D2} = 5.20 F_{D1}$

17. $F_D = 18.3$ N

18. $F_D = 0.0268$ N

19. $F_D = 240$ N

20. $F_D = 0.0235$ N; W = 0.17 N

21. $F_L = 0.15$ N; W = 0.56 N

22. $F_D = 6.01$ N per unit length

23. V = 0.168 m/s; Re = 0.625;

24. Tension = 145 N; $\theta = 55.7°$

25. V = 9.2 m/s.