Homework 4

Study Questions

Commercial AVF 221

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_ Score\_\_\_\_\_

Aerodynamics

1. How does lifting force act?
2. What is effective lift?
3. What are the three ways lift is generated on an airfoil?
4. What are the 2 primary scientific laws and 1 set of equations that explain lift creation?
5. There are 3 concepts dealing with the conservation of: \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_
6. Using the lift equation explain the relationship of doubling the velocity to the amount of lift produced
7. What happens to lift if we increase surface area? (lift equation)
8. What happens to lift if we increase air density? (lift equation)
9. What happens to lift if we increase the coefficient of lift?
10. What is the coefficient of lift?
11. What happens to the coefficient of lift as alpha is increased?
12. Draw a small coefficient of lift curve at right label and note where stall occurs
13. What happens to lift generation as density altitude increases in terms of TAS?
14. Name the 5 types of flaps
15. What are slots?
16. What are slats?
17. How does the Coanda effect explain boundary layer?
18. Where does the stall pattern start on a rectangular wing?
19. What are a couple of ways designers may cause a wing to stall at the root rather than the tip?
20. What is drag and how does it act on the airframe?
21. Name the 2 primary kinds of drag
22. What causes them?
23. Name the different types of Parasite drag
24. Draw a drag curve. Label all axis, the Dp, Di and Dt, stall and L/Dmax
25. What is ground effect?
26. Name the items that occur both leaving and entering ground effect
27. What happens to alpha and drag while in ground effect?
28. Why do these happen?
29. What happens to alpha on the prop as the airplane accelerates assuming fixed pitch prop?
30. Explain how the 4 left turning forces work
31. How does the thrust required and power required curves differ?
32. What happens to the power required curve as weight is increased?
33. Define thrust horsepower, indicated horsepower, and brake horsepower
34. What happens to BHP required as configuration goes from clean to dirty?
35. What happens at the greatest difference between horsepower required and horsepower available?