1. Your best five kilometer (5K) run is 21:42. If a Cessna 172 above cruises at 140 knots (groundspeed), how much sooner would the Cessna 172 finish a five kilometer race?

   A. 20:33 faster
   B. 18:08 faster
   C. 19:26 faster
   D. 19:46 faster

2. If it takes five minutes to climb to 7400 ft MSL from sea level and if the same rate of climb is sustained, how long will it take to climb from sea level to 18,000 ft MSL?

   A. 1220 seconds
   B. 1050 seconds
   C. 730 seconds
   D. 910 seconds

3. A Cessna 210 climbs from an airport (250 ft MSL) to 5000 ft MSL in 4:30. Then, it takes 5:20 to climb from 5000 ft MSL to 10,000 ft MSL. A finally, it takes 6:40 to climb from 10,000 ft MSL to 15,000 MSL. What is the average rate of climb the Cessna 210 attains in the climb from the airport to 15,000 MSL?

   A. 900 FPM
   B. 594 FPM
   C. 671 FPM
   D. 799 FPM

4. You are currently level at 7500 ft MSL cruising towards a national park. This national park has a minimum "over-fly" altitude of 9600 ft MSL. At 20 NM from the nearest boundary of the national park, you plan to climb to cross over this boundary at 11,500 ft MSL. If your TAS is 120 knots, on a TC of 123°, and winds aloft of 180° at 22 knots. What rate of climb is needed to proceed as planned?

   A. 294 FPM
   B. 362 FPM
   C. 490 FPM
   D. 621 FPM

5. With winds aloft of 112° at 34 knots, TAS of 265 km/hr, and a TC of 057°, what is the groundspeed and wind correction angle (WCA)?

   A. 244 knots and WCA 6°R
   B. 160 knots and WCA 10°L
   C. 143 knots and WCA 8°R
   D. 121 knots and WCA 11°R

6. With winds aloft of 244° at 29 kts, TAS of 182 mph, and a TC of 111°, what is the groundspeed and wind correction angle (WCA)?

   A. 200 knots and WCA 7°R
   B. 176 knots and WCA 8°R
   C. 140 knots and WCA 7°L
   D. 189 knots and WCA 4°L

7. You maintain a TAS of 195 mph and TC of 105°. The first portion of the flight (120 NM) the winds aloft are 221° at 34 kts. The second portion of the flight (100 NM) the winds aloft switch to 091° at 45 kts. In the above flight what is the average groundspeed?

   A. 174 knots
   B. 151 mph
   C. 281 km/hr
   D. 204 mph

8. Your aircraft is weighs 24,000 lbs and the CG is at station 120. If 250 kg are removed from station 179, how far forward does the CG move and what is the new CG?

   A. The CG moves 1.38 station units aft to station 121.38
   B. The CG moves 1.38 station units forward to station 118.62
   C. The CG moves 0.62 station units aft to station 120.62
   D. The CG moves 0.62 station units forward to station 119.38

9. This time you are flying an aircraft with a weight of 99,500 lbs and a CG at station 210. Several crates of oil, 200 U.S. Gallons of Oil, are moved from station 280 (aft cargo hold) to station 120 (forward cargo hold). What is the new CG?

   A Station 186.0
   B. Station 207.6
   C. Station 212.4
   D. Station 234.0

10. A turboprop is loaded to a weight of 35,000 lbs. There is a system that allows for credits or reductions of weight for children onboard. The reduction is 100 lbs per child, and there are five children onboard (three at station 200 and two at station 400). What is the new CG if the original CG is at station 360?

    A. Shift of 1.15 forward to station 358.85
    B. Shift of 11.5 forward to station 348.50
    C. Shift of 1.15 aft to station 361.15
    D. Shift of 11.5 aft to station 371.50

11. One afternoon you are preparing for a lesson in a Cessna 172, and your instructor provides you with this hypothetical situation:

    At 7500 ft MSL, you lose your engine. The winds aloft are 120° at 25 knots all the way to the surface. Airport #1 (field elevation of 3100 ft MSL) is 10 NM on a true course of 310°. Airport #2 (field elevation of 350 ft MSL) is 13 NM on a true course of 145°.
    Your glide rate of descent is 700 FPM and your average TAS is 80 knots. Assuming instantaneous turns to the airports. Which, if any, airport can make it to?

    A. You can make both but only barely by 0.1 to 0.25 nautical miles.
    B. You come up short to both airports by more than 1 nautical mile.
    C. You come up short to Airport #1 by 1.2 nautical miles but can land at Airport #2.
    D. You can land at Airport #1 but come up short to Airport #2 by 3.2 nautical miles.

12. You are 22 NM from a VOR. With a groundspeed 200 km/hr, how long does it take to travel clockwise from radial 090° to radial 120°?

A. 3.3 minutes
B. 4.5 minutes
C. 5.2 minutes
D. 6.1 minutes

13. If the time between two radials clockwise, 320° and 015°, is 4:37 and the distance to the VOR is 12 NM, what is the groundspeed between the radials?

A. 152 km/hr
B. 159 knots
C. 164 mph
D. 191 km/hr

14. One evening, you are flying with a groundspeed of 120 knots, an indicated airspeed of 120 knots, OAT is -40°C, and at a pressure altitude of 7500 ft. If the winds aloft are 170° at 20 knots and the wind correction angle is to the right, what is the true course and the true heading?

A. True course = 90° and True heading = 81°
B. True course = 99° and True heading = 90°
C. True course = 90° and True heading = 99°
D. True course = 81° and True heading = 90°

15. You are told that you are flying at 0.42M with an OAT of -20°F at FL310 and 29.92" Hg for an altimeter setting in your area. What is the true airspeed and how much slower than 1.00M are you flying?

A. 475 mph true airspeed and 294 km/hr slower than 1.00M
B. 256 mph true airspeed and 346 mph slower than 1.00M
C. 475 km/hr true airspeed and 655 km/hr slower than 1.00M
D. 294 mph true airspeed and 398 km/hr slower than 1.00M

16. If the OAT is -22°F, your indicated altitude is 6400 ft, and your true altitude is 6600 ft, what is the pressure altitude (PA) and density altitude (DA)?

A. 27000 feet PA and 27500 feet DA
B. 2700 feet PA and -2200 feet DA
C. 24500 feet PA and 22000 feet DA
D. 5600 feet PA and 1300 feet DA

17. Given the calibrated altitude is 17,000 ft, the pressure altitude is 18,000 ft, and the OAT is -05°C, what is the true altitude?

A. 23,200 feet
B. 12,450 feet
C. 18,100 feet
D. 15,150 feet

18. You are cruising at an IAS/CAS of 300 km/hr. The OAT is +20°F. The pressure altitude is 10,000 ft. What is your TAS?

A. 348 mph
B. 216 mph
C. 258 km/hr
D. 258 mph

19. On another afternoon, you are flying a true heading of 270°. You measure your wind drift to be 4°L. On another true heading of 030°, you measure your wind drift to be 6°R. With a TAS of 140 kts, what are the winds aloft?

A. 130° at 16 knots
B. 221° at 19 knots
C. 307° at 15 knots
D. 004° at 23 knots

20. You have 20 Imp. Gallons onboard and burn fuel at 5.8 US Gal./hr. The winds aloft are 220° at 22 kts. You sustain a 144 KTAS. You are on a true course of 100° out and 280° back. If you need 45 minutes reserve fuel upon returning to your base, how far out can you travel before having to return to base?

A. 118 minutes
B. 111 minutes
C. 102 minutes
D. 95 minutes

21. Your instructor tells you that you are given a true airspeed of 210 kts, winds aloft of 040° at 32 kts, and on a true course of 196° out. You also have 80 liters of fuel, burn 7.7 US Gallon per hour, and require a 30 minute fuel reserve. How far can you travel outbound before having to return to base?

A. 52 minutes
B. 59 minutes
C. 65 minutes
D. 72 minutes

22. The altimeter setting your area is 30.87" Hg. Your current indicated altitude is 7500 ft with an OAT of -20°C. You travel a couple of hundred miles to another area where the new altimeter setting is 29.67" Hg. and an OAT of +20°C. How much does your true altitude change when traveling between the first area to the second area?

A. increased by 1150 feet
B. increased by 750 feet
C. decreased by 250 feet
D. decreased by 1050 feet

23. You are flying a large aircraft weighing 125,000 kg. A pallet of cargo (1300 lbs) is removed from station 250. If this results in a aft movement of the CG of 2.2 inches, what is the original and new CG?

A. Original CG at station 203.5 and new CG at station 205.7
B. Original CG at station 465 and new CG at station 467.2
C. Original CG at station 715 and new CG at station 717.2
D. Original CG at station 296.5 and new CG at station 298.7

24. On a true heading of 024°, you experience a drift of 4°L. On a true heading of 311°, you experience a drift of 9°R. With a TAS of 310 km/hr, what are the winds aloft?

A. 183° at 40 knots
B. 160° at 42 knots
C. 222° at 29 knots
D. 005° at 35 knots

25. Cruising at 0.56M with an OAT of -20°F. The altimeter setting is 29.41"Hg and winds aloft are 210° at 44 kts. With a true course of 311°, what is the true airspeed and groundspeed?

A. True Airspeed = 344 knots and Groundspeed = 350 knots
B. True Airspeed = 338 knots and Groundspeed = 357 knots
C. True Airspeed = 355 knots and Groundspeed = 362 knots
D. True Airspeed = 363 knots and Groundspeed = 371 knots

26. - 30.

NIKE is interviewing you for a position flying their Gulfstream V. They are asking you some hypothetical questions to gage your response. Some background information is that you have 13,000 lbs of fuel onboard. The interviewer says for this flight the GV burns fuel at 2000 lbs/hr (above 32,000 feet) and 2200 lbs/hr (below 32,000 feet). Flying at 0.78M with the following winds aloft:

24000	30000	34000	39000
2760-21	2972-33	2884-41	2899-51

You are traveling 2120 miles from Hillsboro, OR (HIO) to Honolulu, HI (HNL).
The True Course from HIO to HNL is 232°.

26. Using the above information, your first choice is 34,000 feet. What is the fuel burn, for the entire flight?

A. 9870 lbs
B. 10510 lbs
C. 10280 lbs
D. 10950 lbs

27. Using the above information, your next selection is to look at 36,000 feet. What is the time en route and fuel burn, for the entire flight?

A. Time in flight = 306 minutes and Fuel burn = 10250 lbs
B. Time in flight = 312 minutes and Fuel burn = 10440 lbs
C. Time in flight = 317 minutes and Fuel burn = 10620 lbs
D. Time in flight = 323 minutes and Fuel burn = 10790 lbs

28. Using the above information, you are asked to calculate a time to turn to return to base with a 45 minutes of reserve fuel? Flown at 30,000 feet.

A. 157.5 minutes
B. 162.0 minutes
C. 166.5 minutes
D. 171.5 minutes

29. You takeoff using the calculations from question 27. Just prior to the halfway point the CEO comes up to the flight deck and asks, "What if we changed altitudes at the halfway point to 30,000 feet from 36,000 feet? Can we get there faster?" If the change is instantaneous, you say:

A. Yes, we would get there 3 minutes faster.
B. Yes, we would get there 8 minutes faster.
C. Yes, we would get there 13 minutes faster.
D. No, we would be there 3 minutes later

30. You fly for 2.5 hours out over the ocean at 34,000 feet and have to return to Hillsboro at the same altitude. The new winds on the return will be 240° at 21 knots. How much fuel will you have upon return to HIO?

A. 5790 lbs
B. 9120 lbs
C. 7440 lbs
D. 3840 lbs

31. 442 km/hr = _____ knots

32. 92 pints of oil = _____ liters of oil

33. 120 Imp. Gallons of AVGAS = _____ kg of AVGAS

34. Mach 1 at +40°F = _____ mph true airspeed

35. 4414 liters of AVGAS = _____ lbs of AVGAS