

1. You're flying FedEx 1348, a Boeing 727 from Billings to Denver at a TAS of 483 knots with winds aloft of 310/78 true. While over Casper, Wyoming, the company calls and says they need to reroute you to Salt Lake City to pick up some extra freight. ATC clears you direct to Salt Lake City. Assuming a variation of 12E, what magnetic heading do you need to fly to maintain a direct course of 244 magnetic?
A. 251
B. 263
C. 271
D. 283
2. After turning on course to Salt Lake City, the company asks for your estimated time of arrival. When you turned, your wristwatch, which is set to central daylight time (UTC-5,) read 10:18pm. FedEx needs the information in UTC since that's all they use. If it's 278 nm from Casper to Salt Lake City, what will you give as your ETA?
A. 04:56
B. 02:56
C. 03:56
D. 05:56
3. When you made the turn towards Salt Lake, you had 19700 pounds of fuel on board. How much fuel will you have upon arrival in Salt Lake City assuming that you burn an average of 9000 pounds per hour?
A. 12000 pounds
B. 13000 pounds
C. 14000 pounds
D. 15000 pounds
4. According to your dispatch release, you'll need to bring the fuel load up to 37000 pounds for your next leg from Salt Lake City to Memphis. Knowing that the fuel gauges on the exterior refueling panel are deferred for maintenance, you figure that you need to tell the fuel truck driver to uplift how many gallons of Jet-A (6.7 pounds/gallon) to bring you up to your desired fuel load?
A. 3731
B. 3432
C. 3582
D. 3283
5. You finally get on your way from Salt Lake City to Memphis, but you've been flight planned over Amarillo, Texas in order to avoid a line of thunderstorms over western Kansas. Your inbound heading to Amarillo is 126 magnetic while holding a course of 121 magnetic with a groundspeed of 531 knots. Your outbound heading from Amarillo is 088 while holding a course of 087 magnetic. Your true airspeed is 487 knots and variation is 10E, what are the winds aloft (true?)
A. 115/57
B. 280/63
C. 260/58
D. 270/60
6. A few months after your Salt Lake City trip, you upgrade to the MD-11 and start flying international. Flying between Shanghai, China and Almaty, Kazakhstan one day, ATC clears you to climb and maintain 10600 meters. (China uses the metric system.) What should your good, old-fashioned American altimeter say once you level off at your new altitude?
A. 34650
B. 36000
C. 31800
D. 32275

7. As you approach the Kazakhstan border, marked by COMMI intersection, ATC tells you to cross 15 kilometers east of COMMI at 9400 meters. According to your navigation display, you're currently 50 nautical miles due east of COMMI. Due to some sensitive cargo on board, you want to descend at no more than 1000 feet/minute. If you maintain a constant groundspeed of 454 knots, how far from COMMI will you have to start your descent to meet the crossing restriction?
- A. **37.6 nautical miles**
 B. 29.5 nautical miles
 C. 54.4 kilometers
 D. 91 kilometers
8. As you descend into the Almaty airport, your captain asks you to get the ATIS. The winds are reported as 360 at 3 meters per second. If you're landing on runway 5, what is your crosswind component?
- A. 11 knots
 B. 9 knots
 C. 7 knots
 D. **5 knots**
9. After your great layover in Almaty, you get ready to depart for Frankfurt, Germany. Not that the MD-11 is lacking in takeoff performance, but knowing that you're in close proximity to the Himalaya mountains, you wonder what the density altitude is. Field elevation is 2300 feet, the temperature is 23C and the altimeter is 30.01. You determine that the answer is:
- A. 3100 feet
 B. **3800 feet**
 C. 5300 feet
 D. 6800 feet
10. With the density altitude calculated in the previous question, and the required fuel load to get to Frankfurt, your onboard computer says that you're limited to 120000 pounds of cargo. The ground crew has already loaded 50000 pounds of freight and has 15 more containers of freight to go. They tell you that each container weighs 3000 kilograms. How many of the containers can you take without exceeding your limit?
- A. 8
 B. 9
 C. **10**
 D. 11
11. After returning home to the USA, you're out flying with your alma-mater's NIFA team helping them prepare for nationals. While riding along on a practice navigation route at 7500 feet MSL with an altimeter setting of 30.12, you decide to see if you still have your old skills. The pilot is flying a heading of 069 magnetic while maintaining a course of 057 magnetic, the variation is 12E, the winds aloft are 253/24 true and the temperature is 12C. What indicated airspeed does the pilot need to fly to maintain a planned groundspeed of 128 knots?
- A. 105 knots
 B. **92 knots**
 C. 113 knots
 D. 97 knots
12. After loading up your Cessna Caravan for a cargo run, you determine that the CG is 1.3" ahead of the forward limit. Assuming a gross weight of 8700 lbs, how far back must a 68 kg pallet be moved to bring the airplane within CG limits?
- A. 166.5"
 B. **75.8"**
 C. 22.3"
 D. 16.7"

13. A takeoff from Runway 10L in Billings, MT requires a climb gradient of 260' / nm in order to clear a set of towers. Assuming a groundspeed of 145 knots, what rate of climb will ensure you will clear the towers?
- A. 1075 ft / min
 - B. 10.5 meters / sec
 - C. 3.2 meters / sec**
 - D. 530 ft / min
14. You decide to test your pilotage and dead reckoning skills by renting a good old C172 minus the high-tech glass cockpit. 30 nm into your 170 nm flight, you realize your skills might be a little rusty as you determine you are 4 nm off course. How many degrees of total correction should you make to get yourself back on course?
- A. 8.0°
 - B. 9.7°**
 - C. 8.6°
 - D. 9.4°
15. Given the following, determine the radius of action:
- Wind: 230° @ 21 knots
 TC: 105°
 CAS: 145 knots
 Pressure Altitude: 5000'
 OAT: 10° C
 Fuel Burn: 12 gph
 Total Fuel on Board: 54 gal
- A. 390 nm
 - B. 350 nm**
 - C. 456 nm
 - D. 333 nm
16. If it takes 90 seconds to cross from the 180° radial to the 186° radial of the DXO VOR while at a groundspeed of 137 knots, how far from the VOR are you?
- A. 34.3 sm
 - B. 23.6 sm
 - C. 28.2 sm
 - D. 39.4 sm**
17. You and a couple of your friends are going to fly to Minneapolis to attend the Republican National Convention. You, John, and Sarah are all loaded up when Sarah realizes she left a bag in the trunk of her car. Assuming her 50 lb. bag is tossed into the cargo compartment (Station 141.5., what will the new CG be if the airplane's gross weight before the bag was added was 3,740 lbs with a CG of 118.0"?
- A. 117.7"
 - B. 121.1"
 - C. 118.3"**
 - D. 114.9"
18. Flying over the Norwegian countryside at a pressure altitude of 2286 meters, what is the density altitude if the OAT is 15° C?
- A. 2800 meters**
 - B. 1710 meters
 - C. 1930 meters
 - D. 2640 meters

19. You have been chosen to do the fly-over of the stadium for Game 1 of the World Series. You'll have to time the fly-over to coincide with the end of the National Anthem, so you decide to circle around a point due North of the stadium. Assuming it takes 1 min 20 sec to sing the Star Spangled Banner, how far away from the stadium should you be circling when the singing begins, if you will be flying at a TAS of 200 kts with winds of $210^\circ @ 14$ kts?
- A. 4.70 nm
 - B. 4.17 nm**
 - C. 2.51 nm
 - D. 2.84 nm
20. A twin engine aircraft is in cruise and will pass over checkpoint A at 1605Z. Its route of flight will then take it directly to checkpoint B, 83 nautical miles away, with a groundspeed of 162 mph. If a single engine aircraft traveling the exact opposite flight path at 90 kts groundspeed flies over checkpoint B at 1630Z, at what time will the two aircraft cross paths?
- A. 1632:12
 - B. 1634:48
 - C. 1636:24**
 - D. 1638:30
21. You are flying at an altitude of 5,500 ft MSL. Ahead of you is a mountain with its peak at 8,000 ft MSL. Wind is 230° true at 27 kts, with a calibrated airspeed of 130 kts. The temperature and pressure are standard, and your magnetic course is 286° , with a magnetic variation of 7° east. How many nautical miles away do you need to begin your climb to clear the peak by 500 ft if your climb rate will be a steady 400 ft/min?
- A. 15.9**
 - B. 16.6
 - C. 17.8
 - D. 19.0
22. You are flying VFR, and you crossed directly over your last checkpoint, right on course. But you are not so lucky on the next one; you are off 6 nm east of your intended course. You've been flying at a TAS of 130 kts for 45 minutes. The wind is 230° true at 28 kts, you have a true course of 190° , and the magnetic variation in the area is 8° east. If your next checkpoint is 34 nm away, how many degrees do you need to correct to fly over it?
- A. 4.5
 - B. 8.0
 - C. 10.5
 - D. 15.0**
23. How many gallons of fuel will you burn getting to that next checkpoint if you are burning 8.7 gal/hr?
- A. 2.2
 - B. 2.8**
 - C. 3.1
 - D. 3.9
24. While flying at an indicated altitude of 7,500 ft MSL with an altimeter setting of 29.42, assuming a standard day, what is your TAS with a CAS of 122 kts?
- A. 108 kts
 - B. 126 kts
 - C. 138 kts**
 - D. 147 kts

25. If you are flying at a true altitude of 24,000ft over an airport with an elevation of 2,000 ft MSL reporting 20°C, assuming a standard temperature lapse rate, how fast would you have to go to reach the speed of sound?
- A. 710 mph**
 B. 740 mph
 C. 775 mph
 D. 800 mph
26. You have already flown 345 nm at a speed of 110kts. You started the trip with 40 gallons of fuel. You now have only 9 gallons left. How fast have you been burning fuel?
- A. 9.9 gal/hr**
 B. 18.8 gal/hr
 C. 12.8 gal/hr
 D. 11.7 gal/hr
27. You are in a Boeing 737 traveling at 460 mph. You have 164 km to go. How much time do you have left on your trip?
- A. 00:13:17**
 B. 00:21:24
 C. 00:11:30
 D. 00:24:36
28. You are burning 49.2 liters of fuel per hour. You're flying at a speed of 172.6 mph and cover a distance of 185 km. How much fuel do you burn?
- A. 52.5 liters
 B. 3.9 gal
C. 8.7 gal
 D. 3.9 liters
29. When you land at your destination, you notice they sell fuel by imperial gallons. You will need to purchase 48 US gallons to get back home. How many gallons should you tell the fueler to put in your airplane?
- A. 5.75
 B. 12
 C. 57.5
D. 40

Use the following information to answer the next 4 questions. You are embarking on a cross country flight from airport A (elev. 260') to airport B (elev. 850') The true course is 61° and you will cover 206 statute miles. The wind is from a steady 310° at 26 knots for all phases of flight and you will cruise at 5,500' MSL.

Climb:	100 KTAS	800 FPM	14.3 GPH
Cruise:	120 KTAS	---	12.0 GPH
Descent:	130 KTAS	650 FPM	7.1 GPH

30. What is your time to climb to 5,500 feet?
- A. 5.2 minutes
 B. 6.36 minutes
C. 6 minutes and 36 seconds
 D. 5 minutes and 2 seconds
31. How many nautical miles will you spend in cruise? (Write your answer on the answer sheet to the nearest mile.) **149 NM-153 NM inclusive**

32. What is your true heading in descent?
- A. 047°
 - B. 050°**
 - C. 072°
 - D. 075°
33. How many gallons of fuel will you burn for this flight? (Write your answer on the answer sheet to the nearest 1/10th of a gallon.) **16.1 gallons-17.1 gallons inclusive**
34. If the pressure altitude is 4,228' at a temperature of 86° F, what is the density altitude?
- A. 6,000'
 - B. 6,500'
 - C. 7,000'**
 - D. 7,500'
35. If your true airspeed is 144 knots at 8,500 MSL with the altimeter set to 29.68" and a temperature of 23° C, what is your indicated airspeed?
- A. 118 knots
 - B. 172 knots
 - C. 214 kph
 - D. 139 mph**
36. If you cover 3 sm in 45 seconds, how fast are you going in knots? (Write your answer on the answer sheet to the nearest 1/10th of a knot.) **207.5 knots-209.95 knots inclusive**
37. What is your time to turn if you have 65 gallons of fuel and burn at 9.3 gph, true course outbound is 088°, the wind is 220° at 32 knots and your TAS is 182 knots?
- A. 180 minutes
 - B. 3 hours 29 minutes
 - C. 190 minutes
 - D. 3 hours 5 minutes**
38. What is your radius of action from the above question?
- A. 623 nm**
 - B. 731 sm
 - C. 1,118 km
 - D. 719 nm
39. You are flying at 6,500 MSL with an altimeter setting of 30.22". The outside temperature is 21° C and you are indicating 133 mph. If the wind is 330° true at 18 knots, how long will a 429 km flight take on a magnetic course of 038°? The local variation is 5° west. (Write your answer on the answer sheet in hh:mm:ss to the nearest second.) **1:53:30-1:54:30 inclusive +/-:30**
40. What is your true heading from the above question? (Write your answer on the answer sheet)
- 024-028 inclusive**