

University of Oklahoma
Department of Aviation

Commercial Flying – AVIA 4552

The lessons in this homework packet correspond to each of the flight lessons you will fly. Each homework lesson is designed to prepare you for the tasks that you will be practicing for that specific training flight.

Each homework lesson consists of the overall objective of the corresponding flight lesson, a required reading list and study questions to reinforce your understanding of the material. In order to adequately prepare for each lesson, you are expected to complete the homework assignment before you come to fly. The maximum grade you may receive for an individual flight lesson if you fail to turn in your homework is a **70%**.

What you should bring to each flight lesson:

- Completed homework
- Completed weight and balance
- Syllabus ticket for that lesson
- Medical, photo ID and logbook

STAGE 10, LESSON 1

This lesson provides a review of basic ground reference maneuvers, steep power turns and chandelles. The student should begin developing precise airplane control when operating near the performance limits of the airplane.

READING ASSIGNMENT

14 CFR Part 1.1 "Definitions and Abbreviations"

14 CFR 61.23 "Medical Certificates: Requirement and Duration"

14 CFR 61.31 "Type Rating Requirements, Additional Training and Authorization Requirements"

14 CFR 61.57 "Recent Flight Experience: Pilot in Command"

14 CFR 61.133 "Commercial Pilot Privileges and Limitations"

FAA Commercial Airplane PTS

STUDY QUESTIONS

1. Within the previous 90 days of carrying passengers, you must complete 3 takeoffs and landings in an aircraft of the same _____, _____, and _____ (if required) as the plane you intend to carry the passengers in.
2. What types of airplanes require a type rating?

_____ (defined as having a max takeoff weight more than _____ lbs)
_____ - powered airplanes

3. If you do not hold an instrument rating, what limitation will be placed on your commercial pilot certificate?

4. What is the minimum class of medical required to conduct operations requiring a commercial pilot certificate?

5. A 20 year old commercial pilot holds a second class medical. He may exercise the commercial privileges of his pilot certificate for _____ months after the date of his medical examination. He may exercise private pilot privileges (renting a plane, for example) for an additional _____ months, however, before requiring a new medical.

STAGE 10, LESSON 2

The objective of this lesson is to review the student's knowledge of complex airplanes. This review includes systems and basic flight operations.

READING ASSIGNMENT

Airplane Flying Handbook – Chapter 11 “Transition to Complex Airplanes”

Piper Arrow POH

STUDY QUESTIONS

1. A complex airplane is defined as an airplane equipped with _____, _____, and a _____ propeller.
2. The range of possible blade angles on a constant speed propeller is termed the propeller's _____.
3. The governing range of a constant speed propeller is defined by the limits of the propeller blade's travel between _____.
4. As long as the propeller blade angle is within the governing range and not against either pitch stop, a _____ will be maintained.
5. What three conditions will the gear warning horn sound on the Arrow?

STAGE 10, LESSON 3

This lesson is complete when the student has conducted the assigned flight. The student should attempt to gain proficiency in the planning of each maneuver.

READING ASSIGNMENT

14 CFR 61.51 “Pilot Logbooks”

14 CFR 47.40 “Registration Expiration and Renewal”

14 CFR 21.181 “Airworthiness Certificates: Duration”

14 CFR 21.197 “Special Flight Permits”

STUDY QUESTIONS

1. What time must be logged in your logbook?
 - a. _____
 - b. _____

2. Aircraft registration certificates expire _____ years after their month of issue.

3. Standard airworthiness certificates are valid as long as _____
_____.

4. A special flight permit may be issued for an aircraft that may not currently _____
_____, but is capable of _____.

5. List 5 reasons a special flight permit may be issued:
 - a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____

STAGE 10, LESSON 4

This lesson is complete when the student has conducted the assigned flight. During the flight, the student should attempt to increase proficiency in the smooth and accurate performance of the listed flight maneuvers in a complex airplane.

READING ASSIGNMENT

Piper Arrow POH – Chapter 2 “Airplane and Systems”

STUDY QUESTIONS

1. Landing gear should not be retracted in the Arrow above a speed of _____ mph and should not be extended above a speed of _____ mph.

2. Diagram the Arrow fuel system below (pg. 2-10 in Arrow POH):

3. What is the purpose of the servo regulator? _____

4. The fuel flow divider receives _____ and distributes _____
_____.

5. The Arrow engine is a _____-cylinder, _____-drive, _____-opposed,
_____ injected engine rated at _____ horsepower at _____ RPM.

STAGE 10, LESSON 5

Steep power turns will be maintained within +/- 150 feet and bank angle and recovery heading within +/- 15 degrees. The student will demonstrate the correct procedures for performing the chandelle. During takeoffs and landings, the student will demonstrate correct airspeed control techniques.

READING ASSIGNMENT

AC 91-67 "Minimum Equipment Requirements for GA Operations Under Part 91"
14 CFR 91.213 "Inoperative Instruments and Equipment"

STUDY QUESTIONS

1. An MEL is a precise list of _____, _____, _____
that allows an aircraft to be operated under _____ with
_____.

2. Who would you contact to obtain an MEL for your airplane? _____

3. Can the MEL for N370U be used for N380U? _____

4. What equipment cannot be listed on an MEL?

5. When operating without an MEL and you discover a piece of inoperative equipment:
 - a. The inoperative equipment must be _____ from the aircraft and the cockpit control _____ OR

 - b. The inoperative equipment must be _____ and placarded
"_____".

STAGE 10, LESSON 6

This lesson is complete when the student has conducted the assigned maneuvers. During the lesson the student should attempt to minimize the transition and setup time between each maneuver.

READING ASSIGNMENT

- 14 CFR 91.171 “VOR Equipment Check for IFR Operations”
- 14 CFR 91.207 “Emergency Locator Transmitters”
- 14 CFR 91.409 “Inspections”
- 14 CFR 91.411 “Altimeter System Equipment Tests and Inspections”
- 14 CFR 91.413 “ATC Transponder Tests and Inspections”
- 14 CFR 21.197 “Special Flight Permits”

STUDY QUESTIONS

1. List the required aircraft inspections and their frequency:

- A _____ due every _____
- V _____ due every _____
- 1 _____ due every _____
- A _____ due every _____
- T _____ due every _____
- E _____ due every _____
- S _____ due every _____

- 2. A 100 hour inspection may be exceeded by no more than _____ hours while enroute to a place where an inspection can be done.
- 3. ELT batteries must be replaced (or recharged) when the transmitter has been used for more than _____ cumulative hour(s) or when _____% of their useful life has expired.
- 4. Who would you contact to obtain a special flight permit? _____

STAGE 10, LESSON 7

The student should show increased proficiency in the review maneuvers by demonstrating correct entry and recovery procedures and increased coordination during the performance of each maneuver. The student also will demonstrate an understanding of the important performance elements of lazy eights, and eights on pylons.

READING ASSIGNMENT

Aeronautical Information Manual – Chapter 3 “Airspace”

STUDY QUESTIONS

1. Class A airspace exists from _____ MSL up to and including _____.
2. Class B airspace generally exists from the surface to _____ **MSL**.
3. Class C airspace generally consists of a 5NM radius core that extends from the surface to _____ AGL and a 10 NM radius shelf that exists from _____ up to _____ AGL surrounding those airports that have an operating control tower, are serviced by a _____, and have a certain number of IFR operations or passenger enplanements.
4. Class D airspace generally exists from the surface to _____ **AGL** around those airports with an operating control tower.
5. Unless designated at a lower altitude, Class E airspace begins at _____ **MSL**.

STAGE 10, LESSON 8

During the performance of this lesson, the student should demonstrate commercial pilot proficiency. Any maneuvers which do not meet this standard will be assigned for additional practice.

READING ASSIGNMENT

Aeronautical Information Manual – Chapter 3 “Airspace”

14 CFR 91.215 “ATC Transponder and Altitude Reporting Equipment and Use”

STUDY QUESTIONS

1. What is the minimum visibility required to fly VFR in Class E airspace below 10,000 MSL? _____ SM
2. What piece of aircraft equipment is required above 10,000 MSL? _____
3. What is the difference between a prohibited area and a restricted area?

4. How far outward from the U.S. coast do warning areas extend? _____
5. What is a Mode C veil and how far outward from the primary airport does it extend?

STAGE 10, LESSON 9

This lesson is complete when the student has conducted the assigned flight. During the flight, the student should attempt to increase proficiency in the smooth and accurate performance of the listed flight maneuvers in the complex airplane.

READING ASSIGNMENT

Pilot's Handbook of Aeronautical Knowledge - Chapter 9 "Weight and Balance"

STUDY QUESTIONS

1. Match the following terms with their definition:

- | | |
|--------------------------|---|
| _____ Useful Load | A. Distance between reference datum and an item |
| _____ Basic Empty Weight | B. Weight multiplied by the arm |
| _____ Payload | C. Passengers, Cargo, Baggage |
| _____ Arm | D. Point where an aircraft would balance if suspended |
| _____ Moment | E. Weight of empty airplane plus optional equipment |
| _____ Center of Gravity | F. Passengers, Baggage, Usable Fuel and Crew |

2. List three effects of an overweight airplane:

3. How do you verify that a calculated C.G. is safely within the limits for your airplane?

4. What is a reference datum?

5. The C.G. is the total _____ divided by the total _____.

STAGE 10, LESSON 10

This lesson is complete when the student has accomplished a solo review of each of the listed maneuvers.

READING ASSIGNMENT

Aeronautical Information Manual – Chapter 8 “Medical Facts for Pilots”

STUDY QUESTIONS

1. Hypoxia can be defined as _____
_____.
2. For maximum protection against hypoxia, pilots are encouraged to use oxygen above _____ feet during the day and _____ at night.
3. Ear blocks and sinus blocks can be prevented by not flying with _____
or _____.
4. If you do not wait a sufficient time after scuba diving, excess evolved gas in your bloodstream may lead to _____ even at lower altitudes.
5. After any SCUBA dive, you should wait _____ hours before flying above 8,000 MSL.

STAGE 10, LESSON 11

This lesson is complete when the student displays an understanding of night flight and the associated normal and emergency procedures

READING ASSIGNMENT

Aeronautical Information Manual – Chapter 8 “Medical Facts for Pilots”
Airplane Flying Handbook – Chapter 10 “Night Operations”

STUDY QUESTIONS

1. A pilot who detects the odor of exhaust or experiences symptoms of _____, _____, or _____ while using the heater should suspect carbon monoxide poisoning.
2. You are flying at night and focusing intently on a point of light in the distant sky. It's only a star, but it appears to move because you are experiencing what visual illusion?

3. You are flying in IMC. While looking down at your iPad, the airplane slowly enters a bank to the right. You look up and quickly correct the flight attitude, but now that you are level, your body is giving you the sensation that you are banking to the left. What illusion are you experiencing? _____
4. You are used to doing your flight training on a runway that is 150 feet wide, but today your instructor takes you to a small airport where the runway is only 50 feet wide. If you don't recognize this illusion, you are likely to fly a _____ than normal approach.
5. What is empty field myopia?

STAGE 10, LESSON 12

This lesson is complete when the student has conducted the solo night flight. During the flight, the student should attempt to gain proficiency in takeoffs and landings in the night environment. After this lesson the student will have completed 10 takeoffs and landings in a traffic pattern at an airport with an operating control tower.

READING ASSIGNMENT

Pilot's Handbook of Aeronautical Knowledge (Appendix 1) – Runway Incursion Avoidance

STUDY QUESTIONS

1. How does the FAA define “runway incursion”?

2. What are three causal factors the FAA has identified for runway incursions?

3. What is a “Hot Spot” and how would you identify it on an Airport Taxi Diagram?

4. If you are unfamiliar with an airport, what can you ask for to get ATC to give you step-by-step taxi instructions? _____

5. What does it mean if ATC tells you “Line up and wait”?

STAGE 10, LESSON 13

The student's increase in night proficiency to that of a commercial pilot will be evident during the post flight evaluation. The student will thoroughly explain the additional operational aspects and safety considerations which are associated with night flight.

READING ASSIGNMENT

14 CFR 91.211 "Supplemental Oxygen"

Pilot's Handbook of Aeronautical Knowledge – Chapter 6 "Aircraft Systems"

STUDY QUESTIONS

1. Required crew of non-pressurized aircraft must use supplemental oxygen after 30 minutes when flying above _____ MSL.
2. Required crew of non-pressurized aircraft must use supplemental oxygen at all times when flying above _____ MSL.
3. Required crew of non-pressurized aircraft must use supplemental oxygen at all times and passengers must be provided with supplemental oxygen when flying above _____ MSL.
4. What is a cannula?

5. What is special about "aviator's breathing oxygen"?

STAGE 10, LESSON 14

This solo lesson is complete when the student has conducted the assigned flight. During the flight, the student should attempt to attain or maintain commercial pilot proficiency.

READING ASSIGNMENT

Pilot's Handbook of Aeronautical Knowledge – Chapter 6 “Aircraft Systems”
“Pressurization Systems” – OU Aviation Website (Flight Resources page)

STUDY QUESTIONS

1. What are two benefits of flying at higher altitudes?

2. On a pressurized aircraft, air from within the pressure vessel is released through a device called an _____ valve.

3. Match the term with its definition:

_____ Cabin Altitude	A. Difference between cabin and ambient pressure
_____ Differential Pressure	B. Pressure of air immediately surrounding aircraft
_____ Aircraft Altitude	C. Cabin pressure in equivalent altitude above sea level
_____ Ambient Pressure	D. Height of the actual aircraft above sea level

4. Two possible causes of decompression are a malfunction in the _____ or _____ to the aircraft.

5. A _____ gauge indicates the difference between inside and outside pressure, a _____ indicates the equivalent altitude of the air inside the cabin, and a _____ instrument indicates the rate of change of the equivalent altitude within the cabin.

STAGE 10, LESSON 15

During the performance of each of the listed maneuvers, the student should demonstrate commercial pilot proficiency. Any maneuvers which do not meet this standard will be assigned for additional practice.

READING ASSIGNMENT

Airplane Flying Handbook – Chapter 5 “Takeoff and Departure Climbs”

Airplane Flying Handbook – Chapter 8 “Approaches and Landings”

Commercial PTS

STUDY QUESTIONS

1. List three common errors in the performance of soft-field takeoffs.

2. The purpose of extending flaps during a soft-field takeoff is to transfer _____ as early as possible.

3. During a soft field takeoff, it is essential the airplane remain in ground effect until at least _____ is reached.

4. Touchdown on a soft or rough field should be made at the _____ airspeed and in a _____ pitch attitude.

5. List three common errors in the performance of soft-field approaches and landings.

STAGE 10, LESSON 16

The student will correctly perform holding pattern entries, wind correction and leg timing for both standard and non-standard holding patterns. All voice communications will be both appropriate and timely, compliance with radar vectors instructions will be accurate, and instrument approaches will meet instrument pilot standards.

READING ASSIGNMENT

Airplane Flying Handbook – Chapter 4 “Slow Flight, Stalls and Spins”
Commercial PTS

STUDY QUESTIONS

1. When performing slow flight, you should select an altitude that will allow the maneuver to be completed no lower than _____ AGL.
2. During slow flight, you should maintain the specified altitude, \pm _____ feet; specified heading, \pm _____ $^{\circ}$; airspeed + _____/- _____ knots, and specified angle of bank, \pm _____ $^{\circ}$.
3. Accelerated stalls most frequently occur during improperly executed _____, _____ recoveries, and pullouts from _____.
4. Power _____ stalls are performed in a clean configuration, while power _____ stalls are performed “dirty” with gear and flaps extended.
5. In accordance with FAA policy, all stalls for the Commercial Certificate/Rating will be taken to the _____ stall condition (*refer to PTS*).

STAGE 10, LESSON 17

This lesson will be complete when the student has conducted the assigned solo flights. During each flight, the student should attempt to perform lazy eights with symmetrical loops and eights-on-pylons, chandelles and steep power turns with smoothness and coordination.

READING ASSIGNMENT

Airplane Flying Handbook – Chapter 9 “Performance Maneuvers”
Commercial PTS

STUDY QUESTIONS

1. List three common errors in the performance of a chandelle:

2. More right rudder is required when rolling out of a chandelle to the _____ due to the increased amount of induced drag created by the lowering of the left aileron during rollout.
3. During performance of commercial steep turns, you should maintain the entry altitude \pm _____ feet, airspeed \pm _____ knots, bank \pm _____ $^\circ$; and roll out on the entry heading, \pm _____ $^\circ$.
4. Operating the engine at idle speed for a prolonged period during a steep spiral may result in excessive _____ or _____, so you should clear the engine periodically by briefly advancing _____.
5. List three common errors in the performance of steep spirals.

STAGE 10, LESSON 18

This lesson is complete when the student has conducted the assigned flight. During the flight, the student should attempt to increase proficiency in the smooth and accurate performance of the listed flight maneuvers in the complex airplane.

READING ASSIGNMENT

Pilot's Handbook of Aeronautical Knowledge – Chapter 10 "Aircraft Performance"

STUDY QUESTIONS

1. Pressure altitude is defined as the height above the _____ datum plane.
2. Density altitude is defined as _____ corrected for _____.
3. _____ density altitude refers to thin air, while _____ density altitude refers to dense air.
4. High temperatures and low altimeter settings _____ density altitude, while low temperatures and high altimeter settings _____ density altitude.
5. The two types of drag are _____ drag, which increases as your speed *increases*, and _____ drag, which increases as your speed *decreases*.

STAGE 10, LESSON 19

At the completion of this lesson, the student should be thoroughly familiar with the flight characteristics, systems and emergency procedures associated with the complex airplane. The student will demonstrate pilot-in-command proficiency.

READING ASSIGNMENT

Airplane Flying Handbook – Chapter 6 “Ground Reference Maneuvers”
Commercial PTS

STUDY QUESTIONS

1. A rule of thumb for estimating pivotal altitude in calm wind is to square the true airspeed and divide by _____ for MPH or _____ for KIAS.
2. The goal of eights-on-pylons is to fly at such an altitude and airspeed that a line parallel to _____ appears to pivot on each of the pylons.
3. As groundspeed increases, the appropriate pivotal altitude will _____.
4. List three common errors in the performance of eights-on-pylons.

5. During the performance of eights-on-pylons, if the reference line appears to move ahead of the pylon, the pilot should _____ altitude. Under no means should rudder be used to yaw the airplane to bring the reference line forward or backward.

STAGE 10, LESSON 20

This lesson will be completed when the student has conducted the assigned solo flight. During the flight, the student should attempt to increase accuracy and coordination on the listed maneuvers.

READING ASSIGNMENT

Pilot's Handbook of Aeronautical Knowledge – Chapter 17 “Aeronautical Decision Making”

STUDY QUESTIONS

1. List the five hazardous attitudes.

2. What is the difference between a “hazard” and a “risk”?

3. “SRM” stands for _____ and is defined as

4. Aeronautical Decision Making (ADM) is defined as a systematic approach to the

5. CFIT stands for _____,

STAGE 10, LESSON 21

All VFR maneuvers will be performed according to FAA practical test standards.

READING ASSIGNMENT

Airplane Flying Handbook – Chapter 7 “Airport Traffic Patterns”

Aeronautical Information Manual – Chapter 4, Section 3 “Airport Operations”

STUDY QUESTIONS

1. You overfly a non-towered airport and see the indication below from the wind cone and segmented circle. Assuming the north-south runway is NOTAM'd closed, which runway would you use (Runway 9 or Runway 27)? _____
2. Would you fly left or right traffic for that runway? _____

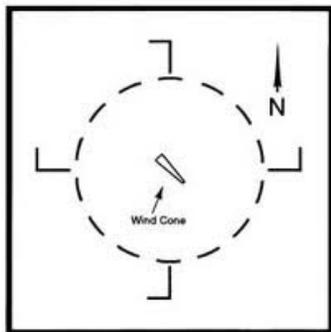


FIGURE 51.—Airport Landing Indicator.

3. What publication would you look in to verify an airport's traffic pattern altitude?

4. When remaining in the traffic pattern, the pilot should commence a turn to the crosswind leg beyond the departure end of the runway within _____ feet of pattern altitude.
5. When departing the traffic pattern, continue straight out or exit with a 45° turn beyond the departure end after reaching _____.

STAGE 10, LESSON 22

This lesson is complete when the student can perform each of the listed maneuvers to the minimum performance standards outlined in the current FAA commercial pilot practical test standards.

READING ASSIGNMENT

Aeronautical Information Manual – Chapter 6 “Emergency Procedures”
Pilot/Controller Glossary

STUDY QUESTIONS

1. What frequency do analog ELTs operate on? _____ MHz
2. Analog ELTs should only be tested during the first _____ minutes after any hour.
3. What does 14 CFR 91.3 allow the pilot-in-command to do? _____

4. What is the difference between “ROGER” and “WILCO”?

5. When traffic is pointed out by an air traffic control facility, the two appropriate responses are either “_____” if you see the traffic, or “_____” if you do not.