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 ______________________
   I ______________________ 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, ±______ feet; specified heading, ±______°; airspeed +____/-_____ knots, and specified angle of bank, ±______°.

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 ±______ feet, airspeed ±_________ knots, bank ±__________°; and roll out on the entry heading, ±____°.

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?

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.

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