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**2025–2026**

Airline Transport Pilot

**TEST PREP**



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AVIATION SUPPLIES & ACADEMICS, INC.  
NEWCASTLE, WASHINGTON

*Airline Transport Pilot Test Prep*  
2025–2026 Edition

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Visit [asa2fly.com/TPATP](https://asa2fly.com/TPATP) for additional information and resources related to this book.

Sample Federal Aviation Administration (FAA) questions herein contain information as of: September 2024. Stay informed of changes since the book was printed: [asa2fly.com/testupdate](https://asa2fly.com/testupdate)

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**Aviation Supplies & Academics, Inc. (ASA)** is an industry leader in the development and sale of aviation supplies and publications for pilots, flight instructors, aviation mechanics, aircraft dispatchers, air traffic controllers, and drone operators. ASA has provided trusted training materials to millions of aviators resulting in successful airman certification for over 80 years. Visit [asa2fly.com](https://asa2fly.com) to learn more.

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Airline Transport Pilot and Aircraft Dispatcher  
(FAA-CT-8080-7D)

# Updates and Practice Tests

## Free Test Updates for the Life Cycle of Test Prep Books

The FAA modifies tests as needed throughout the year. ASA keeps abreast of changes to the tests and posts free Test Updates on the ASA website. Before taking your test, be certain you have the most current information by visiting the ASA Test Updates webpage: [asa2fly.com/testupdate](http://asa2fly.com/testupdate). Additionally, sign up for free email notifications, which are sent when new Test Updates are available.

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Fundamentals of Instructing | Flight Engineer | Airline Transport Pilot | Aviation Mechanic General | Airframe | Powerplant

Practice tests and flashcards are also available as an app for your mobile devices! [asa2fly.com/apps](http://asa2fly.com/apps)

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# Introduction

Welcome to the Aviation Supplies & Academics, Inc., (ASA) Test Prep Series. This series has been helping pilots prepare for the FAA Knowledge Tests for more than 60 years with great success. We are confident that with proper use of this book you will score very well on any of the Airline Transport Pilot tests.

Begin your studies with a classroom or home-study ground school course, which will involve reading a comprehensive textbook. Visit the Reader Resources for this Test Prep ([asa2fly.com/TPATP](http://asa2fly.com/TPATP)) and become familiar with the FAA guidance materials available for the certification exam. Then use this Test Prep to prepare for your exam: read the question, select your choice for the correct answer, and then read the explanation. Use the references that conclude each explanation to identify additional resources for further study of a subject. Upon completion of your studies, take practice tests at [preppure.com](http://preppure.com) (see inside the front cover for your activation code).

The questions in this book have been arranged into chapters based on subject matter to promote better understanding, aid recall, and provide a more efficient study guide. Place emphasis on questions most likely to be included in your test (identified by the aircraft category above each question). For example, a pilot preparing for the ATP Multi-engine test would focus on the questions marked “ALL” and “ATM”; a pilot preparing for the ATP Single-engine test would focus on the questions marked “ALL” and “ATS”; a pilot preparing for the ATP Helicopter (135) test would focus on the questions marked “ALL” and “RTC”; and candidates for the Dispatcher certificate would focus on the questions marked “ALL” and “ADX.”

Prior to taking an FAA Airman Knowledge Test, all applicants must establish an FAA Tracking Number (FTN) by creating a profile in the Integrated Airman Certification and Rating Application (IACRA) system at [iacra.faa.gov](http://iacra.faa.gov). Then visit [faa.psiexams.com](http://faa.psiexams.com) to register for your exam and take FAA-created practice tests to become familiar with the computer testing platform.

It is important to answer every question assigned on your FAA Knowledge Test. If in their ongoing review, the FAA decides a question has no correct answer, is no longer applicable, or is otherwise defective, your answer will be marked correct no matter which one you chose. However, you will not be given the automatic credit if you have not marked an answer. Unlike some other exams you may have taken, there is no penalty for guessing in this instance.

The FAA exams are “closed tests” which means the exact database of questions is not available to the public. The question and answer choices in this book are based on our extensive history and experience with the FAA testing and airman certification process. You might see similarly worded questions on your official FAA exam, or answer stems might be rearranged from the order you see in this book. Therefore, be sure to fully understand the intent of each question and corresponding answer while studying, rather than memorizing the letter associated with the correct response. You may be asked a question that has unfamiliar wording; studying and understanding the information in this book and the associated references will give you the tools to answer question variations with confidence.

If your study leads you to question an answer choice, we recommend you seek the assistance of a local instructor. We welcome your questions, recommendations, and concerns—send them to:

**Aviation Supplies & Academics, Inc.**  
7005 132nd Place SE  
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Phone: 425.235.1500  
Email: [cfi@asa2fly.com](mailto:cfi@asa2fly.com)  
Website: [asa2fly.com](http://asa2fly.com)

The FAA appreciates testing experience feedback. You can contact them at:

**Federal Aviation Administration**  
Training & Certification Group,  
Testing Standards Section  
PO Box 25082  
Oklahoma City, OK 73125  
Email: [TestingStandardsComments@faa.gov](mailto:TestingStandardsComments@faa.gov)

## Description of the Tests

The FAA Knowledge Exam is an objective, multiple choice test. Each question can be answered by one of the three choices. Each test question is independent of the others—a correct response to one question does not depend on the correct response to another. You must score at least 70 percent to pass the test.

The FAA Knowledge Exams are designed to test your knowledge in many subject areas. If you are pursuing an airline transport pilot certificate or added rating, you should review the appropriate sections of 14 CFR Part 61 for the specific knowledge areas on each test. Those taking the ATM or “ATP–Airline Transport Pilot Multi-engine” exam will be tested on Part 121 as one of the knowledge areas. Those taking the ATS or “ATP–Airline Transport Pilot Single-engine” exam will be tested on Part 135 as one of the knowledge areas.

An applicant for an Aircraft Dispatcher Certificate should review the appropriate sections of 14 CFR Part 65 for the specific knowledge areas on the test. The applicant will be tested on Part 121 as one of the knowledge areas. If Part 135 commuter operators (as defined in DOT Part 298) are required to have aircraft dispatchers in the future, Part 135 questions will be added to the test. The aircraft dispatcher applicant is not required to have the flying skills of an airline transport pilot but is expected to have the same knowledge.

If it's been more than 24 months since you took the initial ATP FAA Knowledge Exam, we recommend that you prepare for the Add-On test using the “ATP Single-engine” or “ATP–Helicopter (Part 135)” test. This will better prepare you for all questions that may be included on your add-on test.

The table below lists the number of questions and the allotted time for each test. Each question in this book is preceded by a category. Use these categories to study the content that may appear on your test. Study all the questions first, then refer to the following table, placing emphasis on those questions most likely to be included on your test (identified by the test prep category above each question number).

Test Code	Test Name	Test Prep Study	Number of Questions	Min. Age	Allotted Time (hrs)
ADX	Aircraft Dispatcher	ALL, ADX	80	21	3.5
ATM	ATP Multi-engine Airplane	ALL, ATM	125	18	3.5
ATS	ATP Single-engine Airplane (Part 135)	ALL, ATS	90	21	2.5
ATH	ATP–Helicopter (Part 135)	ALL, RTC	80	21	3.0
ARH	ATP–Helicopter–Added Rating (Part 135)*	ALL, RTC	50	21	2.5
ACM	ATP Canadian Conversion ME**	ALL, ATM	60	23	2.5
ASC	ATP Canadian Conversion SE**	ALL, ATS	40	23	2.0
ACH	ATP Canadian Conversion–Helicopter**	ALL, RTC	40	23	2.0

\* This test focuses on U.S. regulations, procedures, and operations.

**Note:** All applicants transitioning from ATP airplane and/or helicopter need to take the additional knowledge test. For example, an applicant adding a helicopter rating to an existing ATP airplane certificate will need to take the 50-question add-on test.



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## Knowledge Test Registration

The FAA testing provider authorizes hundreds of test center locations that offer a full range of airman knowledge tests. For information on authorized testing centers and to register for the knowledge test, visit [faa.psiexams.com](http://faa.psiexams.com).

When you contact a knowledge testing center, be prepared to select a test date and make payment. You may register for test(s) several weeks in advance online or by phone, and you may cancel in accordance with the testing center's cancellation policy.

Regardless of your registration method, you will need an FAA Tracking Number (FTN) prior to registering for the FAA Airman Knowledge Test. This FTN will follow you throughout your aviation career. You will obtain your FTN as part of the test registration process, by creating a profile in the Integrated Airman Certificate and Rating Application (IACRA) system at [iacra.faa.gov/IACRA](http://iacra.faa.gov/IACRA). This FTN will be printed on your Airman Knowledge Test Report (AKTR).

The test registration process includes collection of this information: name, FTN, physical address, date of birth, email address, photo identification, phone number, test authorization (credentials for an individual, such as a graduation certificate for an authorized ATP certification training program [CTP]), and previous number of test attempts.

Step 1: Create a profile using the IACRA system and login to obtain your FTN.

Step 2: Register for your knowledge test with PSI by phone or online.

For more information, contact:

**PSI Services LLC**

844-704-1487 or [examschedule@psionline.com](mailto:examschedule@psionline.com)

[faa.psiexams.com](http://faa.psiexams.com)

## Knowledge Test Eligibility

When you take your FAA Knowledge Test, you will be required to show proper identification. The ATP and dispatcher tests do not require instructor endorsements or other form of written authorization, except in the case of retesting (see Retesting Procedures).

An applicant taking the ATM test must present a graduation certificate that shows completion of an ATP Certification Training Program (CTP) described in 14 CFR §61.156. A graduation certificate must contain the following information in order to be considered valid:

1. The full name, address, and FAA certificate number of the training provider authorized to conduct the course.
2. The full name, FAA pilot certificate number, and address of the graduate.
3. The following statement: "The applicant named above has successfully completed the airline transport pilot Certification Training Program as required by §61.156, and therefore has met the prerequisite required by §61.35(a)(2) for the airline transport pilot airplane knowledge test."
4. The date of issuance.
5. The signature of the authorized instructor who completed the academic portion of the course.
6. A sequential number on the certificate starting with the first four identifiers of the training provider's certificate number.

## Acceptable Materials

The applicant may use test aids and materials within the guidelines listed below during the test, if actual test questions or answers are not revealed.

Acceptable Materials	Unacceptable Materials	Notes
Supplement book provided by proctor.	Written materials that are hand-written, printed, or electronic.	Testing centers may provide calculators and/or deny the use of personal calculators.
All models of aviation-oriented calculators or small electronic calculators that perform only arithmetic functions.	Electronic calculators incorporating permanent or continuous type memory circuits without erasure capability.	Test proctor may prohibit the use of your calculator if he or she is unable to determine the calculator's erasure capability.
Calculators with simple programmable memories, which allow addition to, subtraction from, or retrieval of one number from the memory; or simple functions, such as square root and percentages.	Magnetic cards, magnetic tapes, modules, computer chips, or any other device upon which pre-written programs or information related to the test can be stored and retrieved.	Printouts of data must be surrendered at the completion of the test if the calculator incorporates this design feature.
Scales, straight-edges, protractors, plotters, navigation computers, blank log sheets, holding pattern entry aids, and electronic or mechanical calculators that are directly related to the test.	Dictionaries.	Before, and upon completion of the test, while in the presence of the test proctor, actuate the ON/OFF switch or RESET button, and perform any other function that ensures erasure of any data stored in memory circuits.
Manufacturer's permanently inscribed instructions on the front and back of such aids, such as formulas, conversions, regulations, signals, weather data, holding pattern diagrams, frequencies, weight and balance formulas, and ATC procedures.	Any booklet or manual containing instructions related to use of test aids.	Test proctor makes the final determination regarding aids, reference materials, and test materials.

## Testing Procedures for Applicants Requesting Special Accommodations

If you are an applicant with a learning or reading disability, you may request approval from the local FAA office to take an airman knowledge test, using the special accommodations procedures outlined in the most current version of FAA Order 8080.6 Conduct of Airman Knowledge Tests.

Prior to approval of any option, the FAA Aviation Safety Inspector must advise you of the regulatory certification requirement of being able to read, write, speak, and understand the English language.

---

## Test Reports

Your test will be graded immediately upon completion and your score will display on the computer screen. You will receive your Airman Knowledge Test Report (AKTR), which will state your score. See sample AKTR on next page.

Visit [faa.psiexams.com](http://faa.psiexams.com) to request a duplicate or replacement AKTR due to loss or destruction.

Airman Knowledge Test Reports are valid for 24 calendar months. If the AKTR expires before completion of the practical test, you must retake the knowledge test.

The AKTR lists the Airman Certification Standard (ACS) code (if an Airman Certification Standard is available for the certificate and rating specific to the test) or Learning Statement Code (LSCs) (if a Practical Test Standard is in effect for the certificate and rating specific to the test) for questions answered incorrectly. The total number of ACSs/LSCs shown on the AKTR is not necessarily an indication of the total number of questions answered incorrectly. Study these knowledge areas to improve your understanding of the subject matter. See Cross-Reference B in the back of this book for a listing of ACSs/LSCs and their associated questions.

Your instructor is required to provide instruction on each of the knowledge areas listed on your AKTR and to complete an endorsement of this instruction. You must present this to the examiner prior to taking the practical test. During the oral portion of the practical test, the examiner is required to evaluate the noted areas of deficiency.

## Retesting Procedures

Applicants retesting *after failure* are required to submit the applicable AKTR indicating failure, along with an endorsement (on the test report) from an authorized instructor, who gave the applicant the additional training, certifying the applicant is competent to pass the test. The original failed AKTR and retest endorsement presented as authorization shall be retained by the proctor and attached to the applicable sign-in/out log. The latest test taken will reflect the official score.

Applicants retesting *in an attempt to achieve a higher passing score* may retake the same test for a better grade after 30 days. The latest test taken will reflect the official score. Applicants are required to submit the original applicable AKTR indicating previous passing score to the testing center prior to testing. Testing center personnel must collect and destroy this report prior to issuing the new test report.

Dispatcher (ADX) retests do not require a 30-day waiting period if the applicant presents a signed statement from an airman holding a certificate and rating sought by the applicant. This statement must certify that the airman has given the applicant additional instruction in each of the subjects failed, and that the airman considers the applicant ready for retesting. However, this test requires a 30-day waiting period for retesting if the applicant presents a failed test report without a signed statement.

## Cheating or Other Unauthorized Conduct

Computer testing centers must follow strict security procedures to avoid test compromise. These procedures are established by the FAA and are covered in FAA Order 8080.6 Conduct of Airman Knowledge Tests. The FAA has directed testing centers to terminate a test at any time a test proctor suspects a cheating incident has occurred. An FAA investigation will then be conducted. If the investigation determines that cheating or unauthorized conduct has occurred, then any airman certificate or rating that you hold may be revoked, and you will be prohibited for one year from applying for or taking any test for a certificate or rating under Part 61.

**U.S. DEPARTMENT OF TRANSPORTATION  
Federal Aviation Administration  
Airman Knowledge Test Report**

**NAME:** TAYLOR SMITH  
**FAA TRACKING NUMBER (FTN):** C1234567 **EXAM ID:** 98765432109876543  
**EXAM:** ATP Single-engine Airplane (Part 135) (ATS)  
**EXAM DATE:** 09/15/2024 **EXAM SITE:** ABC12345  
**SCORE:** 88% **GRADE:** Pass **TAKE:** 1

The Airman Certification Standards (ACS) codes listed below represent incorrectly answered questions. These ACS codes and their associated Areas of Operation/Tasks/Elements may be found in the appropriate ACS document at [http://www.faa.gov/training\\_testing/testing/acs](http://www.faa.gov/training_testing/testing/acs).

A single code may represent more than one incorrect response.

AA.I.B.K3e AA.I.G.K5 AA.I.D.K9 AA.II.A.K7 AA.III.B.R1 AA.IV.A.K2d AA.VI.E.K1

**EXPIRATION DATE:** 09/30/2026

**DO NOT LOSE THIS REPORT**

-----  
AUTHORIZED INSTRUCTOR'S STATEMENT: (if applicable)

On \_\_\_\_\_ (date) I gave the above named applicant \_\_\_\_\_ hours of additional instruction, covering each subject area shown to be deficient, and consider the applicant competent to pass the knowledge test.

Name \_\_\_\_\_

Cert. No. \_\_\_\_\_ (print clearly)

Type of instructor certificate \_\_\_\_\_

Signature \_\_\_\_\_

**FRAUDULENT ALTERATION OF THIS FORM BY ANY PERSON IS A BASIS FOR SUSPENSION OR REVOCATION  
OF ANY CERTIFICATES OR RATINGS HELD BY THAT PERSON.**

**ISSUED BY: PSI Services LLC  
FEDERAL AVIATION ADMINISTRATION**

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Sample Airman Knowledge Test Report

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## Test-Taking Tips

Prior to launching the actual test, the test proctor's testing software will provide you with an opportunity to practice navigating through the test. This practice (or tutorial) session may include a "sample" question(s). These sample questions have no relation to the content of the test, but are meant to familiarize you with the look and feel of the system screens, including selecting an answer, marking a question for later review, time remaining for the test, and other features of the testing software.

Follow these time-proven tips, which will help you develop a skillful, smooth approach to test-taking:

- Visit **faa.psiexams.com** to take a small sample test to become familiar with the latest PSI exam interface you will see on your actual FAA knowledge test.
- Be careful to fully understand the intent of each question and corresponding answer while studying, rather than memorize the A, B, C answer choice—answer stems may appear in a different order than you studied and have some wording differences.
- Remember to bring an ATP-CTP graduation certificate (as applicable), photo I.D., the testing fee, calculator, flight computer (ASA's E6-B or CX-3 Flight Computer), plotter, magnifying glass, and a sharp pointer, such as a safety pin.
- Your first action when you sit down should be to write any formulas and information you can remember from your study on the scratch paper they will provide. Remember, some of the formulas may be on your E6-B.
- Read each question carefully before looking at the possible answers. You should clearly understand the problem before attempting to solve it.
- After formulating an answer, determine which answer choice corresponds the closest with your answer. The answer chosen should completely resolve the problem.
- From the answer choices given, it may appear that there is more than one possible answer. However, there is only one answer that is correct and complete. The other answers are either incomplete, erroneous, or represent popular misconceptions.
- Answer each question in accordance with the latest regulations and guidance publications.
- If a certain question is difficult for you, tag it for REVIEW and proceed to the other questions. After you answer the less difficult questions, return to those which you tagged and answer them. Be sure to untag these questions once you have answered them. The review marking procedure will be explained to you prior to starting the test. Although the computer should alert you to unanswered questions, make sure every question has an answer recorded. This will allow you to use the available time to your maximum advantage.
- Perform each math calculation twice to confirm your answer. If adding or subtracting a column of numbers, reverse your direction the second time to reduce the possibility of error.
- When solving a calculation problem, select the answer nearest to your solution.
- Remember that information is provided in the Legends and Figures contained within the Airman Knowledge Testing Supplement (FAA-CT-8080 document) you'll be using during the test.
- Remember to answer every question, even the ones with no completely correct answer, to ensure the FAA gives you credit for a bad question.
- Take your time and be thorough but relaxed. Take a minute off every half-hour or so to relax your brain and body. Stay hydrated.

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# ATP Certificate Eligibility Requirements

If you are pursuing an airline transport or aircraft dispatcher certificate, you should review 14 CFR §61.23 “Medical Certificates: Requirement and Duration,” §61.35 “Knowledge Test: Prerequisites and Passing Grades,” and Part 61 (ATP or Part 65 (ADX) for certificate requirements.

To be eligible for an Airline Transport Pilot Certificate, a person must:

1. Be at least 23 years old (or 21 if meeting §61.160 requirements).
2. Be of good moral character.
3. Read, write, and understand English, and speak it without impediment that would interfere with radio conversation.
4. Have a current third-class medical certificate.
5. Pass a knowledge examination on the appropriate subjects with a score of at least 70 percent.
6. Pass an oral and flight check on the subjects and maneuvers in the Airline Transport Pilot and Type Rating Airman Certification Standards (ASA-ACS-11).
7. Have a Commercial Pilot Certificate or foreign or military equivalent.
8. For an ATP–Airplane Multi-Engine or an ATP obtained concurrently with an airplane type rating, receive a graduation certificate from an authorized training provider certifying completion of an ATP certification training program specified in §61.156 before applying for the knowledge test.
9. For an ATP certificate with an airplane category and class rating, have at least 1,500 hours of total time as a pilot that includes at least:
  - a. 500 hours of cross-country flight time.
  - b. 100 hours of night flight time.
  - c. 50 hours of flight time in the class of airplane for the rating sought.
  - d. 75 hours of instrument flight time, in actual or simulated instrument conditions.
  - e. 250 hours of PIC time.
10. For a rotorcraft category and helicopter class rating, have 1,200 hours pilot time including:
  - a. 500 hours cross-country flight time.
  - b. 100 hours night time, at least 15 hours in helicopters.
  - c. 200 hours in helicopters including 75 hours PIC time.
  - d. 75 hours of actual or simulated instrument time with at least 50 hours in flight and 25 hours PIC time in helicopters.

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# Knowledge Exam References

The FAA references the following documents to write the FAA Knowledge Exam questions. You should be familiar with all of these as part of your ground school studies, which you should complete before starting test preparation.

*Aerodynamics for Naval Aviators*

*Aeronautical Chart User's Guide*

FAA-H-8083-1 *Aircraft Weight and Balance Handbook*

FAA-H-8083-2 *Risk Management Handbook*

FAA-H-8083-3 *Airplane Flying Handbook*

FAA-H-8083-15 *Instrument Flying Handbook*

FAA-H-8083-16 *Instrument Procedures Handbook*

FAA-H-8083-21 *Helicopter Flying Handbook*

FAA-H-8083-25 *Pilot's Handbook of Aeronautical Knowledge*

FAA-H-8083-28 *Aviation Weather Handbook*

FAA-S-ACS-11 *Airline Transport Pilot and Type Rating for Airplane Airman Certification Standards*

AC 00-24 *Thunderstorms*

AC 00-30 *Atmospheric Turbulence Avoidance*

AC 00-54 *Pilot Wind Shear Guide*

AC 20-117 *Hazards Following Ground Deicing & Ground Operations in Conditions Conducive to Aircraft Icing*

AC 91-6 *Water, Slush and Snow on the Runway*

AC 91-43 *Unreliable Airspeed Indication*

AC 91-51 *Effect of Icing on Aircraft Control and Airplane Deice and Anti-Ice Systems*

AC 91-74 *Pilot Guide: Flight in Icing Conditions*

AC 120-51 *Crew Resource Management Training*

AC 120-58 *Pilot Guide Large Aircraft Ground Deicing*

AC 120-100 *Basics of Aviation Fatigue*

AC 135-17 *Pilot Guide Small Aircraft Ground Deicing*

*Chart Supplements U.S.*

IFR Enroute High Altitude Chart

IFR Enroute Low Altitude Chart

U.S. Terminal Procedures

*Aeronautical Information Manual (AIM)*

14 CFR Parts 1, 23, 25, 61, 63, 71, 91, 97, 110, 111, 117, 119, 121, 135

49 CFR Parts 172, 175, 830, 1544

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Visit [asa2fly.com/TPATP](http://asa2fly.com/TPATP) for reader resources useful to airline transport pilots and aircraft dispatchers.

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# Acronyms

For reference, acronyms appearing in this book are defined below.

AC	Advisory Circular	DP	departure procedure
AC	Convective Outlook	EDCT	estimated departure clearance time
ADC	air data computer	EFC	expect further clearance
ADF	automatic direction finder	EFD	electronic flight display
ADIZ	Air Defense Identification Zone	EGT	exhaust gas temperature
ADM	aeronautical decision making	ELT	emergency locator transmitter
ADS-B	Automatic Dependent Surveillance–Broadcast	EPR	engine pressure ratio
AFM	aircraft flight manual	ESHP	equivalent shaft horsepower
AGL	above ground level	ETA	estimated time of arrival
AIRMET	airmen’s meteorological information	ETOPS	extended range twin-engine operations
ALD	available landing distance	FAF	final approach fix
ANU	airplane nose up	FAR	Federal Aviation Regulation
ARFF	aircraft rescue and firefighting	FAROS	final approach occupancy signal
ARTCC	Air Route Traffic Control Center	FB	winds and temperatures aloft forecast
ASDE-X	Airport Surface Detection Equipment–Model X	FDP	flight duty period
ASOS	Automated Surface Observing System	FIS-B	Flight Information Services–Broadcast
ASR	airport surveillance radar	FL	flight level
ASSC	airport surface surveillance capability	FPD	freezing point depressant
ATC	air traffic control	FSDO	Flight Standards District Office
ATD	along-track distance (RNAV/GPS)	FSS	Flight Service Station
ATP	airline transport pilot	GBAS	ground-based augmentation system
BHP	brake horsepower	GNSS	Global Navigation Satellite System
BMEP	brake mean effective pressure	GPS	Global Positioning System
BOW	basic operating weight	GPWS	ground proximity warning system
CAS	calibrated airspeed	GS	ground speed
CAT	clear air turbulence	GTG-2	Graphical Turbulence Guidance
CDI	course deviation indicator	HAT	height above touchdown
CFIT	controlled flight into terrain	HEMES	hospital emergency medical evacuation service
CG	center of gravity	HIRL	high intensity runway lights
CONUS	continental/contiguous United States	HS	hot spot (runway)
CRM	crew resource management	HSI	horizontal situation indicator
CWA	center weather advisory	IAP	instrument approach procedure
DA	decision altitude	IAS	indicated airspeed
DC	dry chemical (firefighting)	ICAO	International Civil Aviation Organization
DH	decision height	IFR	instrument flight rules
DME	distance measuring equipment	ILS	instrument landing system
		IMC	instrument meteorological conditions



INS	internal navigation system	OAT	outside air temperature
IR	Instrument Route (MTR)	OBS	omni bearing selector
IRU	inertial reference unit (DME)	OCS	obstacle clearance surface
ISA	international standard atmosphere	OIS	obstacle identification surface
KIAS	knots indicated airspeed	OROCA	off-route obstruction clearance altitude
LAHSO	land and hold short operations	PAPI	precision approach path indicator
LDA	localizer directional aid	PAR	precision approach radar
LEMAC	leading edge of mean aerodynamic chord	PDSC	pre-departure service check
LLWAS	Low-Level Wind Shear Alert System	PFD	primary flight display
LNAV	lateral navigation	PIC	pilot-in-command
LOC	localizer (ILS)	PIREP	pilot report
LPV	localizer performance with vertical guidance	POH	pilot's operating handbook
LTE	loss of tail rotor effectiveness	PPH	pounds per hour
MAC	mean aerodynamic chord	PRM	precision runway monitor
MAP	manifold pressure	psi	pounds per square inch
MAWP	missed approach waypoint	RA	resolution advisory
MDA	minimum descent altitude	RAFC	Regional Aera Forecast Center
MEA	minimum enroute altitude	RAIM	receiver autonomous integrity monitoring
MEL	Minimum Equipment List	RCAM	runway condition assessment matrix
METAR	aviation routine weather report	RCLS	runway centerline lighting system
MFD	multi-function display	REIL	runway end identifier lights
MGT	measured gas temperature	REL	runway entrance lights
MHA	minimum holding altitude	RFFS	rescue and firefighting services
MLS	microwave landing system	RFM	rotorcraft flight manual
MOA	Military Operating Area	RIL	runway intersection lights
MOCA	minimum obstacle clearance altitude	RNAV	area navigation
MON	Minimum Operational Network (VOR)	RNP	required navigation performance
MSA	minimum safe/sector altitude	RVR	runway visual range
MSL	mean sea level	RVSM	reduced vertical separate minimum
MTOW	maximum takeoff weight	RwyCC	runway condition code
MTR	Military Training Route	SDF	simplified directional facility
MVA	minimum vectoring altitude	SIAP	standard instrument approach procedure
NAS	National Airspace System	SIC	second-in-command
NAVAID	navigational aid	SID	standard instrument departure
NDB	non-directional beacon	SIGMET	significant meteorological information
NM	nautical mile	SL	sea level
NMAC	near midair collision	SM	statute mile
NOTAM	Notice to Air Missions	STAR	standard terminal arrival route
NTSB	National Transportation Safety Board	TA	traffic advisory
NTW	net total weight	TAF	terminal aerodrome forecast

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TAS	true airspeed
TAT	total air temperature
TAWS	terrain awareness system
TDZE	touchdown zone elevation
TDZL	touchdown zone lights
THL	takeoff hold lights
TIBS	Telephone Information Briefing Service
TIS-B	Traffic Information Service–Broadcast
TIT	turbine inlet temperature
UAT	Universal Access Transceiver
VASI	visual approach slope indicator
VDP	visual descent point
VFR	visual flight rules
VHF	very high frequency
VOR	VHF Omnidirectional Range
VORTAC	VOR-TACAN navigation system
VOT	VOR Test Facility
VR	Visual Route (MTR)
WAAS	Wide Area Augmentation System
WW	severe weather watch bulletin
ZFW	zero fuel weight

# ASA Test Prep Layout

Sample FAA questions have been sorted into chapters according to subject matter. Within each chapter, similar questions are grouped together following introductory chapter text. Figures referenced in the chapter text are numbered with the appropriate chapter number, e.g., “Figure 1-1” is Chapter 1’s first chapter text figure.

Some sample FAA questions refer to Figures or Legends immediately following the question number, e.g., “8201. (Refer to Figure 14.)” These are FAA Figures and Legends from the Airman Knowledge Testing Supplement (FAA-CT-8080-7D) that can be found at the back of this book. This supplement will be provided to you as a separate booklet when you take your FAA test.

Following each sample FAA test question is ASA’s explanation in italics. The last line of the explanation contains a Learning Statement Code (LSC), for those tests referencing an FAA Practical Test Standard (PTS), or Airman Certification Standards (ACS) code, for those tests with an ACS, as well as a reference for further study. Some questions include an explanation for the incorrect answers for added clarity. When you encounter a difficult question, find the LSC or ACS code in Cross-Reference B, and then look for material relating to the subject description within the given reference(s). Refer to Cross-Reference B for more information on how to use LSCs or ACS codes for effective studying.

Answers to each question are found at the bottom of each page.

## EXAMPLE:

### Chapter text

Four aerodynamic forces are considered to be basic because they act upon an aircraft during all flight maneuvers. There is the downward-acting force called WEIGHT which must be overcome by the upward-acting force called LIFT, and there is the rearward-acting force called DRAG, which must be overcome by the forward-acting force called THRUST.

**Category rating. This question may be found on tests for these ratings.\***

ALL, ATM, ATS, ADX, RTC

**8201.** (Refer to Figure 14.) The four forces acting on an airplane in flight are

**See the Airman Knowledge Testing Supplement at the back of the book.**

A— lift, weight, thrust, and drag.

B— lift, weight, gravity, and thrust.

C— lift, gravity, power, and friction.

**Question and answer choices**

*Lift, weight, thrust, and drag are the four basic aerodynamic forces acting on an aircraft in flight.*

**Explanation**

*(PLT235, AA.III.A.K1) — FAA-H-8083-25*

**Code line. FAA LSC and ACS codes in parentheses, followed by references for further study.**

*Answer (B) is incorrect because the force of gravity is always the same number and reacts with the airplane’s mass to produce a different weight for almost every airplane. Answer (C) is incorrect because weight is the final product of gravity, thrust is the final product of power, and drag is the final product of friction. Power, gravity, and friction are only parts of the aerodynamic forces of flight.*

**Incorrect answer explanation. Reasons why answer choices are incorrect explained here.**

\* **Note:** The FAA does *not* identify which questions are on the different ratings’ tests. Unless the wording of a question is pertinent to only one rating category, it may be found on *any* of the tests.

**ALL** = All operations      **ATM** = Multi-engine operations  
**ATS** = Single-engine operations      **ADX** = Dispatcher      **RTC** = Rotorcraft

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# Chapter 2

## **Equipment, Navigation, and Facilities**

Inoperative Equipment	<b>2-3</b>
Pitot-Static Instruments	<b>2-4</b>
Electronic Flight Instruments	<b>2-10</b>
Safety of Flight Equipment	<b>2-12</b>
Communications	<b>2-17</b>
Navigation Equipment	<b>2-18</b>
Horizontal Situation Indicator (HSI)	<b>2-23</b>
Global Navigation	<b>2-28</b>
Approach Systems	<b>2-29</b>
Global Positioning System (GPS)	<b>2-36</b>
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Approach Lighting	<b>2-53</b>

## Inoperative Equipment

A certificate holder's manual must contain enroute flight, navigation and communication procedures, including procedures for the dispatch, release or continuance of a flight if a required piece of equipment becomes inoperative.

When any required instrument or equipment in an aircraft is inoperative, the airplane cannot be flown unless that aircraft's **Minimum Equipment List (MEL)** allows such a flight.

The pilot-in-command of an aircraft operating IFR in controlled airspace shall report to ATC immediately any malfunction of navigational, approach or communications equipment that occurs in flight. The report must include:

- Aircraft identification;
- Equipment affected;
- Degree to which the capability of the aircraft to operate IFR in the ATC system is impaired; and
- Nature and extent of assistance desired from ATC.

ALL

**9407.** An approved minimum equipment list or FAA Letter of Authorization allows certain instruments or equipment

- A—to be inoperative prior to beginning a flight in an aircraft if prescribed procedures are followed.
- B—to be inoperative anytime with no other documentation required or procedures to be followed.
- C—to be inoperative for a one-time ferry flight of a large airplane to a maintenance base without further documentation from the operator or FAA with passengers on board.

*The Minimum Equipment List and the letter of authorization constitute a supplemental type certificate for the aircraft. The approved MEL must provide for the operation of the aircraft with the instruments and equipment in an inoperable condition (PLT405, AA.II.A.K2c) — 14 CFR §91.213*

ATM, ATS, RTC

**9380.** What action is necessary when a partial loss of ILS receiver capability occurs while operating in controlled airspace under IFR?

- A—Continue as cleared and file a written report to the Administrator if requested.
- B—If the aircraft is equipped with other radios suitable for executing an instrument approach, no further action is necessary.
- C—Report the malfunction immediately to ATC.

*The pilot-in-command of an aircraft operating IFR in controlled airspace shall report to ATC as soon as practical any malfunction of navigational, approach or communication equipment that occurs in flight. (PLT356, AA.VI.E.K1) — 14 CFR §91.187*

*Answer (A) is incorrect because any malfunction of approach equipment must be reported in flight, not by a written report. Answer (B) is incorrect because, although another type of instrument approach may be executed if permission is granted by ATC, any malfunction of approach equipment should be reported.*

ATM, ATS, RTC

**9381.** What action should be taken if one of the two VHF radios fail while IFR in controlled airspace?

- A—Notify ATC immediately.
- B—Squawk 7600.
- C—Monitor the VOR receiver.

*The pilot-in-command of an aircraft operating IFR in controlled airspace shall report to ATC as soon as practical any malfunction of navigational, approach or communication equipment that occurs in flight. (PLT162, AA.VI.D.K3) — 14 CFR §91.187*

*Answer (B) is incorrect because, although you have experienced a communications failure, it is only a partial one. You still have one operational VHF radio and all other radios are working normally, so a squawk of 7600 is not needed. Answer (C) is incorrect because you still have an operable VHF radio for communication, so monitoring of a NAVAID is not needed. The only pilot action required is notification to ATC of the problem.*

### Answers

9407 [A]

9380 [C]

9381 [A]

ATM, ATS, RTC

**9386.** While flying IFR in controlled airspace, if one of the two VOR receivers fails, which course of action should the pilot-in-command follow?

- A—No call is required if one of the two VOR receivers is operating properly.
- B—Advise ATC immediately.
- C—Notify the dispatcher via company frequency.

*The pilot-in-command of an aircraft operating IFR in controlled airspace shall report to ATC as soon as practical any malfunction of navigational, approach or communication equipment that occurs in flight. (PLT406, AA.VI.D.K3) — 14 CFR §91.187*

*Answer (A) is incorrect because any malfunction of a navigational radio should be reported, no matter how slightly it may affect the conduct of the flight. Answer (C) is incorrect because, although this may be a common practice among the air carriers, the regulations require notification to ATC of the malfunction.*

ATM, ATS, RTC

**9387.** While flying in controlled airspace under IFR, the ADF fails. What action is required?

- A—Descend below Class A airspace.
- B—Advise dispatch via company frequency.
- C—Notify ATC immediately.

*The pilot-in-command of an aircraft operating IFR in controlled airspace shall report to ATC as soon as practical any malfunction of navigational, approach or communication equipment that occurs in flight. (PLT406, AA.VI.D.K3) — 14 CFR §91.187*

*Answer (A) is incorrect because controlled airspace exists far below positive control airspace (base of 18,000 feet MSL), and any loss of a navigational aid should be reported to ATC. Answer (B) is incorrect because, although this may be a common practice among the air carriers, the regulations require notification to ATC of the malfunction.*

ATM, ADX

**8278.** If a required instrument on a multi-engine airplane becomes inoperative, which document required under 14 CFR Part 121 dictates whether the flight may continue en route?

- A—A Master Minimum Equipment List for the airplane.
- B—Original dispatch release.
- C—Certificate holder's manual.

*Each certificate holder's manual must contain enroute flight, navigation, and communication procedures for the dispatch, release or continuance of flight if any item of equipment required for the particular type of operation becomes inoperative or unserviceable en route. (PLT436, AA.I.G.K4) — 14 CFR §121.135*

## Pitot-Static Instruments

Modern jet transports usually have three pitot-static systems. There are separate systems for the captain's and copilot's instruments plus an auxiliary system that provides a backup for either of the two primary systems. The instruments that require static pressure input are **airspeed, Mach, altitude and vertical speed indicators**. In addition, the airspeed and Mach indicators need a source of pitot pressure. Besides the flight instruments, static pressure input is required for the Mach warning, autopilot, flight director, flight recorder, and cabin differential pressure. Pitot input is required for all those systems except for cabin differential pressure. The usual source for these non-flight instruments is the auxiliary pitot-static system. See Figure 2-1.

Altimeters compare the sea level pressure setting in their window with the outside air pressure sensed through the static system. The difference is displayed as the altitude above sea level. Part of the preflight check is to verify the accuracy of the altimeters. An altimeter should be considered questionable if the indicated altitude varies by more the 75 feet from a known field elevation.

The altimeter setting used by pilots is always the station pressure of the reporting station corrected to sea level. **Station pressure** is the actual pressure at field elevation.

**True altitude** is the actual height of the aircraft above sea level. This is the same as indicated altitude when standard temperatures exist. When the temperature is warmer than standard, true altitude is higher than indicated altitude. When the temperature is colder than standard day conditions, just the opposite is true. Corrected altitude (approximately true altitude) can be calculated but it is neither practical

### Answers

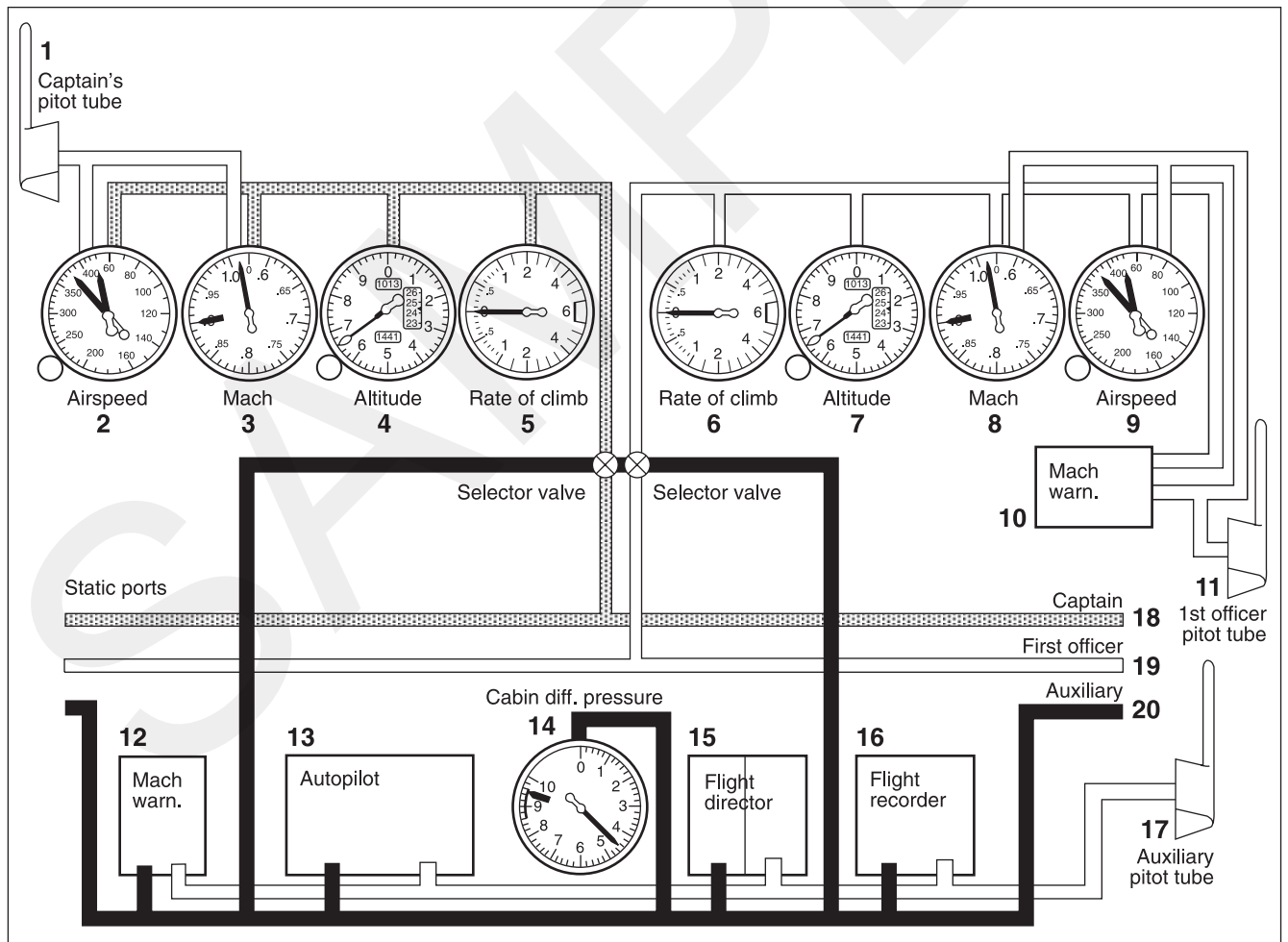
9386 [B]                      9387 [C]                      8278 [C]

nor useful to do so in most situations. When setting an altimeter, a pilot should just use the appropriate altimeter setting and disregard the effects of nonstandard atmospheric pressures and temperatures.

**Pressure altitude** is the altitude indicated when the altimeter is set to standard sea level pressure of 29.92 "Hg. Density altitude is used in aircraft performance computations. It is pressure altitude corrected for nonstandard temperatures. If the temperature is warmer than standard, density altitude will be higher than pressure altitude.

The local altimeter setting is used when flying below FL180 and the altimeter is 31.00 "Hg or less. Special procedures apply when the local pressure is more than 31.00 "Hg because most altimeters cannot be set higher than that. In the United States, all altimeters are set to 29.92 "Hg when climbing through FL180. Caution: outside the United States the transition altitude is often something other than FL180.

A common reason for altimeter errors is incorrect setting of the altimeter. If the setting in the altimeter is higher than the actual sea level pressure, the altimeter will read higher than the actual altitude. If the setting is too low, the altimeter will read lower than it really is. As a rough rule of thumb, the magnitude of the error is about 1,000 feet for each 1 "Hg that the altimeter is off. For example, if the altimeter is set to 29.92 "Hg, but the real sea level pressure is 30.57 "Hg, the altimeter will read about 650 feet lower than the actual airplane's altitude ( $30.57 - 29.92 = 0.65$  "Hg = 650 feet). In this example, the airplane would be 650 feet higher than the indicated altitude.



**Figure 2-1.** Typical pitot-static system

The airspeed indicators compare pitot pressure with static pressure and display the difference as **indicated airspeed**. This indicated airspeed equals the aircraft's actual speed through the air (True Airspeed) only under standard day conditions at sea level. Under almost all flight conditions, true airspeed will be higher than indicated airspeed because of the lower ambient pressures at altitude.

The Machmeter displays aircraft speed as a percentage of the speed of sound. For example, an aircraft cruising at a Mach number of .82 is flying at 82 percent of the speed of sound. The Machmeter works in a manner similar to the airspeed indicator in that it compares pitot and static pressure, but these inputs are corrected by an altimeter mechanism.

If a pitot tube becomes blocked, the airspeed and Mach indicators will read inaccurately. If pressure is trapped in the pitot line, the airspeed will read inaccurately high as the aircraft climbs, low as it descends, and will be unresponsive to changes in airspeed. The airspeed indicator acts as an altimeter because only the static pressure changes. This situation occurs in icing conditions if both the ram air inlet and the drain hole of the pitot tube become completely blocked by ice.

If the pitot tube is blocked but the static port and the pitot drain hole remain open, the indicated airspeed will drop to zero. The drain pitot tube drain hole allows the pressure in the pitot line to drop to atmospheric and therefore there is no differential between the static and pitot pressures.

Pitot tubes and static ports are electrically heated to prevent ice formations that could interfere with proper operation of the systems. They are required to have "power on" indicator lights to show proper operation. In addition, many aircraft have an ammeter that shows the actual current flow to the pitot and static ports.

Since the magnetic compass is the only direction-seeking instrument in most airplanes, the pilot must be able to turn the airplane to a magnetic compass heading and maintain this heading. It is influenced by magnetic dip which causes northerly turning error and acceleration/deceleration error. When northerly turning error occurs, the compass will lag behind the actual aircraft heading while turning through headings in the northern half of the compass rose, and lead the aircraft's actual heading in the southern half. The error is most pronounced when turning through north or south, and is approximately equal in degrees to the latitude.

The acceleration/deceleration error is most pronounced on headings of east and west. When accelerating, the compass indicates a turn toward the north, and when decelerating it indicates a turn toward the south. The acronym **ANDS** is a good memory aid:

- A** accelerate
- N** north
- D** decelerate
- S** south

No errors are apparent while on east or west headings when turning either north or south.



ALL

**9174.** Which pressure is defined as station pressure?

- A—Altimeter setting.
- B—Actual pressure at field elevation.
- C—Station barometric pressure reduced to sea level.

*The pressure measured at a station or airport is station pressure or the actual pressure at field elevation. (PLT166, AA.I.A.K13) — FAA-H-8083-28*

*Answer (A) is incorrect because altimeter setting is the value to which the scale of a pressure altimeter is adjusted to read field elevation. Answer (C) is incorrect because station barometric pressure reduced to sea level is a method to readily compare station pressures between stations at different altitudes.*

ALL

**9164.** What is corrected altitude (approximate true altitude)?

- A—Pressure altitude corrected for instrument error.
- B—Indicated altitude corrected for temperature variation from standard.
- C—Density altitude corrected for temperature variation from standard.

*True altitude is indicated altitude corrected for the fact that nonstandard temperatures will result in nonstandard pressure lapse rates. (PLT023, AA.I.A.K13) — FAA-H-8083-28*

*Answer (A) is incorrect because pressure altitude corrected for instrument error is a nonexistent concept. Answer (C) is incorrect because density altitude is pressure altitude corrected for temperature variation from standard. Density altitude is a final figure and not subject to additional adjustments.*

ATM, ATS, RTC

**9099.** When setting the altimeter, pilots should disregard

- A—effects of nonstandard atmospheric temperatures and pressures.
- B—corrections for static pressure systems.
- C—corrections for instrument error.

*Pilots should disregard the effect of nonstandard atmospheric temperatures and pressures except that low temperatures and pressures need to be considered for terrain clearance purposes. (PLT166, AA.I.A.K13) — AIM ¶7-2-2*

*Answers (B) and (C) are incorrect because altimeters are subject to instrument errors and to errors in the static pressure system. A pilot should set the current reported altimeter setting on the altimeter setting scale. The altimeter should read within 75 feet of field elevation. If not, it is questionable and should be evaluated by a repair station.*

ALL

**9173.** If the ambient temperature is colder than standard at FL310, what is the relationship between true altitude and pressure altitude?

- A—They are both the same, 31,000 feet.
- B—True altitude is lower than 31,000 feet.
- C—Pressure altitude is lower than true altitude.

*True altitude is indicated altitude corrected for the fact that nonstandard temperatures will result in nonstandard pressure lapse rates. In warm air, you fly at a true altitude higher than indicated. In cold air, you fly at a true altitude lower than indicated. Pressure altitude is the altitude indicated when the altimeter is set to the standard sea level pressure (29.92 "Hg). In the United States, altimeters are always set to 29.92 "Hg at and above 18,000 feet. This question assumes the difference between the pressure altitude and the indicated altitude (local altimeter setting) is not significant enough to reverse the effects of the temperature. (PLT023, AA.I.D.K3) — FAA-H-8083-28*

*Answer (A) is incorrect because both true and pressure altitude would be the same at FL310 if the ambient air temperature was standard. Answer (C) is incorrect because pressure altitude would be lower than true altitude in warmer than standard air temperature.*

ALL

**9173-1.** When the temperature is -20°C at 15,000 feet indicated, you know that

- A—altimeters automatically compensate for temperature variations.
- B—the altimeter is indicating higher than true altitude.
- C—the altimeter is indicating lower than true altitude.

*The ISA for 15,000 feet is -15°C. When the temperature is colder than standard, the altimeter will indicate higher than true altitude. (PLT023, AA.I.D.K3) — FAA-H-8083-28*

**Answers**

9174 [B]

9164 [B]

9099 [A]

9173 [B]

9173-1 [B]

ALL

**9172.** If the ambient temperature is warmer than standard at FL350, what is the density altitude compared to pressure altitude?

- A—Lower than pressure altitude.
- B—Higher than pressure altitude.
- C—Impossible to determine without information on possible inversion layers at lower altitudes.

*Pressure altitude is the altitude indicated when the altimeter is set to the standard sea level pressure (29.92 "Hg). Density altitude is pressure altitude corrected for nonstandard temperature. A warmer than standard temperature will result in a density altitude higher than the pressure altitude. (PLT023, AA.I.D.K3) — FAA-H-8083-28*

*Answer (A) is incorrect because density altitude is higher when air temperature is warmer than standard. Answer (C) is incorrect because density altitude is pressure altitude corrected for non-standard temperatures. Pressure altitude is based on a standard pressure atmosphere at a particular altitude, and inversion layers at lower levels have no effect on pressure altitude.*

ALL

**9813.** Given

Pressure altitude..... 1,000 ft  
 True air temperature ..... 10°C

From the conditions given, the approximate density altitude is

- A—1,000 feet MSL
- B—650 feet MSL
- C—450 feet MSL

1. *Using an E6B flight computer, refer to the right-hand "Density Altitude" window. Note that the scale above the window is labeled air temperature (°C). The scale inside the window itself is labeled pressure altitude (in thousands of feet). Rotate the disc and place the pressure altitude of 1,000 feet opposite an air temperature of 10°C.*

2. *The density altitude shown in the window is 650 feet. You can also answer this using an electronic flight computer, such as the CX-3. Select Altitude from the CX-3 FLT menu. (PLT005, AA.I.D.K3) — FAA-H-8083-28*

ALL

**9163.** En route at FL270, the altimeter is set correctly. On descent, a pilot fails to set the local altimeter setting of 30.57. If the field elevation is 650 feet, and the altimeter is functioning properly, what will it indicate upon landing?

- A—585 feet.
- B—1,300 feet.
- C—Sea level.

*One inch of Hg pressure is equal to about 1,000 feet of altitude. In the United States, altimeters are always set to 29.92 "Hg at and above 18,000 feet. If the altimeter is not reset when descending into an area with a local altimeter setting of 30.57 "Hg, an error of 650 feet will result (30.57 – 29.92 = 0.65 = 650 feet). If the altimeter is set lower than the actual setting, it will read lower than the actual altitude. (PLT166, AA.I.D.K3) — FAA-H-8083-28*

*Answer (A) is incorrect because 585 feet is the result of subtracting 65 feet rather than subtracting 650 feet. Answer (B) is incorrect because 1,300 feet is the result of adding 650 feet rather than subtracting 650 feet.*

ATM, ATS, RTC

**9080.** During an en route descent in a fixed-thrust and fixed-pitch attitude configuration, both the ram air input and drain hole of the pitot system become completely blocked by ice. What airspeed indication can be expected?

- A—Increase in indicated airspeed.
- B—Decrease in indicated airspeed.
- C—Indicated airspeed remains at the value prior to icing.

*If both the ram air input and the drain hole are blocked, the pressure trapped in the pitot line cannot change and the airspeed indicator may react as an altimeter. The airspeed will not change in level flight even when actual airspeed is varied by large power changes. During a climb the airspeed indication will increase. During a descent the airspeed indication will decrease. (PLT128, AA.I.D.K3) — AC 91-43*

*Answer (A) is incorrect because indicated airspeed will decrease in a descent. Answer (C) is incorrect because indicated airspeed will remain at the same value during level flight.*

**Answers**

9172 [B]                      9813 [B]                      9163 [C]                      9080 [B]

**2025–2026**

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