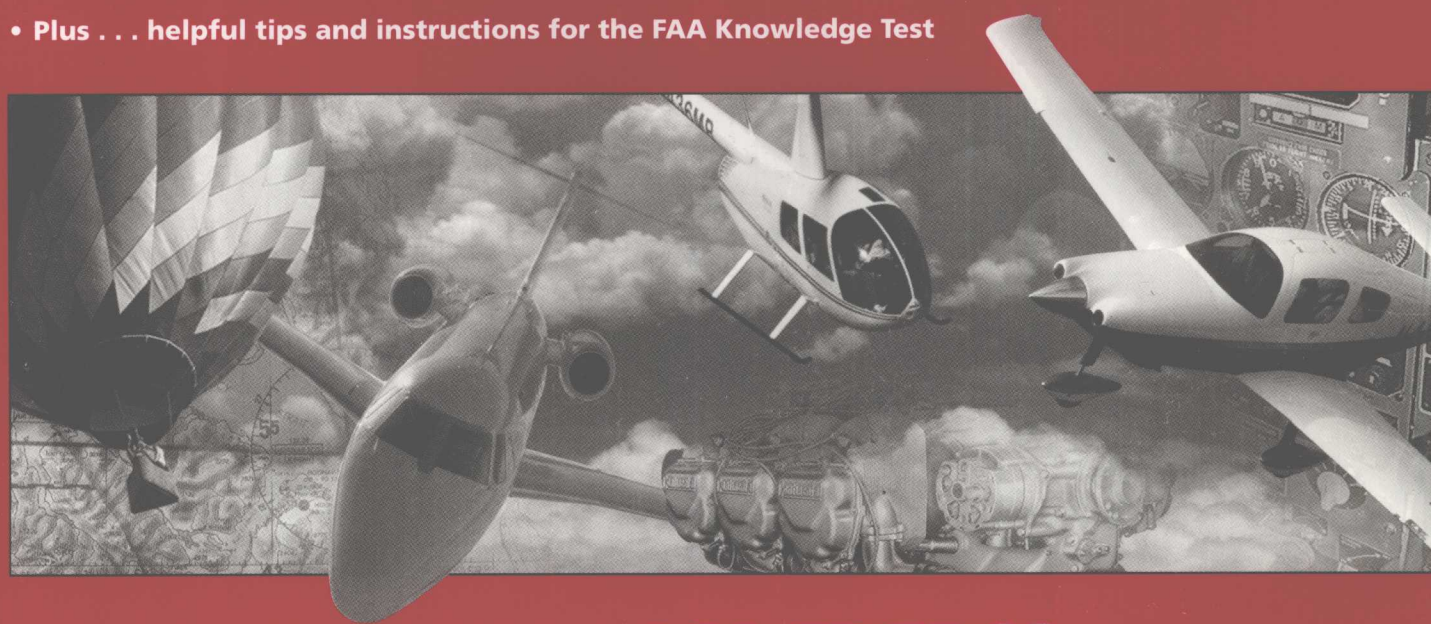
Flight Engineer 2003 Test Prep

Study and Prepare for the Flight Engineer: Basic, Turbojet, Turboprop, Reciprocating and Add-On Rating FAA Knowledge Tests

- Effective June 2002, with Free Updates available online until June 2003
- All FAA Flight Engineer Questions included
- Organized by subject
- Answers, Explanations, References and additional Study Material included for each chapter
- Includes the official FAA Computerized Testing Supplement
- Plus . . . helpful tips and instructions for the FAA Knowledge Test



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Aviation Supplies & Academics, Inc.
Newcastle, Washington

Flight Engineer Test Prep
2003 Edition

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FAA Questions herein are from United States government sources and contain current information as of: June 10, 2002.

None of the material in this publication supersedes any documents, procedures or regulations issued by the Federal Aviation Administration.

ASA assumes no responsibility for any errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

Important: This Test Prep should be sold with and used in conjunction with *Computerized Testing Supplement for Flight Engineer* (FAA-CT-8080-6A).

ASA reprints the FAA test figures and legends contained within this government document, and it is also sold separately and available from aviation retailers nationwide. Order #ASA-CT-8080-6A.

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About ASA: Aviation Supplies & Academics, Inc. (ASA) is an industry leader in the development and sale of aviation supplies and publications for pilots, flight instructors, flight engineers, and aviation maintenance technicians. We manufacture and publish more than 200 products for the aviation industry. Aviators are invited to call 1-800-ASA-2-FLY for a free copy of our catalog. Visit ASA on the web: **www.asa2fly.com**

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Cliff Seretan began flying in 1979 to find fulfillment beyond a successful management career in state government. Over the next several years, he added on certificates and ratings while gaining experience through flying coast-to-coast in light aircraft; then, his flight instructor certificate enabled him to more economically pursue two of his passions—flying and teaching. Cliff taught primary and advanced flight students in the Northeast in a variety of aircraft. In the last few years, he has had the opportunity to diversify his business with aviation management as well as analysis and development of aviation computer products and flight simulator programs. Cliff holds a Commercial Certificate with an Instrument Rating for Single and Multi-Engine Land Airplanes and CFI for Airplane Land and Instrument. With undergraduate and graduate degrees in the Arts, Sciences and Management from New York University, Connecticut College and the State University of New York at Stony Brook, he brings to ASA a blend of aviation and business skills that combine a unique perspective with in-depth subject knowledge.

Preface

Welcome to ASA's Test Prep Series. ASA's test books have been helping pilots prepare for the FAA Knowledge Tests since 1984 with great success. We are confident that with proper use of this book, you will score very well on any of the Flight Engineer tests.

All of the questions in the FAA FE Test Question Bank are included here, and have been arranged into chapters based on subject matter. Topical study, in which similar material is covered under a common subject heading, promotes better understanding, aids recall, and thus provides a more efficient study guide. We suggest you begin by reading the book cover-to-cover. Then go back to the beginning and place emphasis on those questions most likely to be included in your test (identified by the aircraft and test category above each question). For example: a candidate preparing for the Turbojet Flight Engineer test would focus on the questions marked "ALL" and "FEX" and a candidate preparing for the Reciprocating Flight Engineer test would focus on the questions marked "ALL" and "FEN." Those preparing for the add-on tests (people who hold a Flight Engineer certificate in one category and are transitioning to another) would focus on the questions marked FEX (for the turbojet add-on), FEN (for the reciprocating add-on), or FET (for the turboprop add-on).

It is important to answer every question assigned on your FAA Knowledge Test. If in their ongoing review, the FAA authors decide 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 unless you have marked an answer. Unlike some other exams you may have taken, there is no penalty for "guessing" in this instance.

The FAA does not supply the correct answers to questions reproduced in this book, is not responsible for answers contained herein, and will not reveal what they consider the correct answers to be. The question and answer choices are duplicated from the FAA Question Bank; however, the FAA presents the questions in a different numerical sequence, they change the sequence of the A, B, C answer choices on the FAA website (http://afs600.faa.gov/Default.htm), and they include only samples of typical questions. They do this to discourage applicants from learning the test material by rote memory. The ASA test preps include a much wider sampling of the questions the FAA will issue at the test centers. A clear explanation is given directly below each question. Be careful to fully understand the intent of each question and corresponding answer while studying, rather than memorize the A, B, C question. If your study leads you to question an answer choice, we recommend you seek the assistance of a local ground or flight instructor. If you still believe the answer needs review, please forward your questions, recommendations, or concerns to:

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Update Information

Free Test Updates for the One-Year Lifecycle of Test Prep Books

The FAA releases a new test database each spring, and makes amendments to this database approximately twice a year. However, a small number of questions may be withheld from the public for a period of time while the FAA gathers statistics and validates these questions. This means not all the questions are available to the public via the internet-posted databases, but they are being issued at the FAA testing centers. ASA combines years of experience with expertise in working with the tests to prepare the most comprehensive and accurate test preparation materials available in the industry.

You can feel confident that you will be prepared for your FAA Knowledge Exam by using the ASA test prep products. ASA publishes test books each July and stays abreast of all changes to the tests, as well as the new questions that have been validated, and posts these changes on the ASA website as a Test Update. Visit the ASA website before taking your test to be certain you have all the current information:

www.asa2fly.com

Description of the Tests

All test questions are multiple-choice with three choices of answers. Each question can be answered by the selection of a single response, is independent of other questions, and has equal value.

Applicants must successfully complete a knowledge test appropriate to the desired rating. Applicants desiring to add a class rating to their flight engineer certificate must successfully complete a knowledge test appropriate to the desired class rating.

Test Code	Test Name	Test Prep Study	Number of Questions	Min. Age	Allotted Time (hrs)
FEX	Turbojet and Basic	FEX, ALL	80	19	3.0
FET	Turboprop and Basic	FET, ALL	80	19	3.0
FEN	Reciprocating and Basic	FEN, ALL	80	19	3.0
FEJ	Turbojet (Added Rating)	FEX	50	19	2.0
FEP	Turboprop (Added Rating)	FET	50	19	2.0
FER	Reciprocating (Added Rating)	FEN	50	19	2.0

A score of 70 percent must be attained to successfully pass each test.

Acceptable Forms of Authorization

1. Federal Aviation Administration commercial pilot certificate with an instrument rating, or airline transport pilot certificate not limited to visual flight rules (VFR).
2. Written statement on company letterhead, signed by a company official, validating that the applicant meets one of the practical experience requirements of Title 14 of the Code of Federal Regulations (14 CFR) Part 63, section 63.37(b), subparagraphs 1, 2 or 3.
3. Logbook entry showing an accumulation of more than 200 hours as pilot-in-command or second-in-command performing the functions of a pilot-in-command under the supervision of a pilot-in-command (14 CFR §63.37(b)(5)).
4. Logbook entry or endorsement for practical experience requirements as a flight engineer (14 CFR §63.37(b)(6)).
5. Completion, within the previous 90 days, of the ground portion of an approved Part 63, Appendix C flight engineer training course for the applicable class rating (14 CFR §63.37(b)(7)).
6. For added rating knowledge tests: Flight engineer certificate or an Airman Knowledge Test Report for a flight engineer original class rating.
7. Failed, passing or expired Airman Knowledge Test Report, provided the applicant still has the ***original*** test report in his/her possession. (*See* Retesting explanation.)

Retesting

Applicants retesting ***after failure*** are required to submit the applicable score report indicating failure, along with an endorsement from an authorized instructor who gave the applicant the additional training, and certifying the applicant is competent to pass the test. The original failed test report 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 score report 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.

Process for Taking a Knowledge Test

The FAA has available hundreds of computer testing centers worldwide. These testing centers offer the full range of airman knowledge tests including military competence, instrument foreign pilot, and pilot examiner screening tests. Refer to the list of computer testing designees (CTDs) at the end of this section.

The first step in taking a knowledge test is the registration process. You may either call the testing centers' 1-800 numbers or simply take the test on a walk-in basis. If you choose to use the 1-800 number to register, you will need to select a testing center, schedule a test date, and make financial arrangements for test payment. You may register for tests several weeks in advance, and you may cancel your appointment according to the CTD's cancellation policy. If you do not follow the CTD's cancellation policies, you could be subject to a cancellation fee.

You should determine what authorization requirements are necessary before going to the computer testing center. Your instructor or local Flight Standards District Office (FSDO) can assist you with what documentation to take to the testing facility. Testing center personnel will not begin the test until you provide the proper identification.

Before you take the actual test, you will have an option to take a sample test. The actual test is time limited; however, there should be sufficient time to complete and review your test.

Upon completion of the knowledge test, you will receive your Airman Test Report, with the testing center's embossed seal, which reflects your score.

The Airman Test Report lists the subject matter knowledge codes for questions answered incorrectly. The total number of subject matter knowledge codes shown on the Airman Test Report 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* the *Subject Matter Knowledge Code/ Question Number Cross-Reference* in the back of this book for a complete list of which questions apply to each subject matter knowledge code.

Your instructor is required to provide instruction on each of the knowledge areas listed on your Airman Test Report and to complete an endorsement of this instruction. You must present the Airman Test Report 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.

Should you require a duplicate Airman Test Report due to loss or destruction of the original, send a signed request accompanied by a check or money order for $1 payable to the FAA. Your request should be sent to the Federal Aviation Administration, Airmen Certification Branch, AFS-760, P.O. Box 25082, Oklahoma City, OK 73125.

Computer Testing Designees

The following is a list of the computer testing designees authorized to give FAA knowledge tests. This list should be helpful in case you choose to register for a test or simply want more information. The latest listing of computer testing center locations may be obtained through the FAA website: http://afs600.faa.gov/Default.htm, then select AFS630, Airman Testing Standards, Computer Testing Sites.

Computer Assisted Testing Service (CATS)

1849 Old Bayshore Highway
Burlingame, CA 94010
Applicant inquiry and test registration: 1-800-947-4228
From outside the U.S.: (650) 259-8550

LaserGrade Computer Testing

16209 S.E. McGillivray, Suite L
Vancouver, WA 98683
Applicant inquiry and test registration: 1-800-211-2753 or 1-800-211-2754
From outside the U.S.: (360) 896-9111

International pilots who want to apply for an FAA certificate based on their ICAO foreign certificates should go to the nearest FAA Flight Standards District Office (FSDO). Phone numbers for these offices will be found in the blue pages of the local telephone book. This will allow you to fly a U.S.-registered aircraft while in the U.S. If you hold instrument privileges on your foreign license, you can take a 50-question knowledge test (Instrument Rating—Foreign Pilot), and if you pass it, have instrument privileges added to this FAA private pilot certificate.

If you are outside of the U.S., you will have to go in person to an FAA International Field Office (IFO) and apply for an FAA private pilot certificate. When outside of the U.S. you will only be authorized to fly a U.S.-registered aircraft.

International Field Offices (IFO)

1. Brussels, Belgium (32-2) 508.2721
   FAA C/O American Embassy, PSC 82 Box 002, APO AE 09710
2. Frankfurt, Germany (49-69) 69.705.111
   FAA C/O IFO EA-33 Unit 7580, APO AE 09050
3. London, England (44-181) 754.88.19
   FAA C/O American Embassy, PSC 801 Box 63, FPO AE 09498-4063
4. Singapore (65) 543-1466
   FAA C/O American Embassy, PSC 470 AP 96507-0001

These special certificates will not allow you to fly for hire in the U.S. To qualify for a "clean" FAA commercial pilot certificate or higher, you must meet the full certification requirements of 14 CFR Part 61, for the level of certificate you are requesting. Your current, logged flying time will count towards the required experience. However, all required training, knowledge, and practical tests must be completed.

Use of Test Aids and Materials

Airman knowledge tests require applicants to analyze the relationship between variables needed to solve aviation problems, in addition to testing for accuracy of a mathematical calculation. The intent is that all applicants are tested on concepts rather than rote calculation ability. It is permissible to use certain calculating devices when taking airman knowledge tests, provided they are used within the following guidelines. The term "calculating devices" is interchangeable with such items as calculators, computers, or any similar devices designed for aviation-related activities.

1. Guidelines for use of test aids and materials. The applicant may use test aids and materials within the guidelines listed below, if actual test questions or answers are not revealed.
   a. Applicants may use test aids, such as scales, straightedges, protractors, plotters, navigation computers, log sheets, and all models of aviation-oriented calculating devices that are directly related to the test. In addition, applicants may use any test materials provided with the test.
   b. Manufacturer's permanently inscribed instructions on the front and back of such aids listed in 1(a), e.g., formulas, conversions, regulations, signals, weather data, holding pattern diagrams, frequencies, weight and balance formulas, and air traffic control procedures are permissible.
   c. The test proctor may provide calculating devices to applicants and deny them use of their personal calculating devices if the applicant's device does not have a screen that indicates all memory has been erased. The test proctor must be able to determine the calculating device's erasure capability. The use of calculating devices incorporating permanent or continuous type memory circuits without erasure capability are prohibited.
   d. The use of magnetic cards, magnetic tapes, modules, computer chips, or any other device upon which prewritten programs or information related to the test can be stored and retrieved are prohibited. Printouts of data will be surrendered at the completion of the test if the calculating device used incorporates this design feature.
   e. The use of any booklet or manual containing instructions related to the use of the applicant's calculating device is not permitted.
   f. Dictionaries are not allowed in the testing area.
   g. The test proctor makes the final determination relating to test materials and personal possessions that the applicant may take into the testing area.

2. Guidelines for dyslexic applicant's use of test aids and materials. A dyslexic applicant may request approval from the local Flight Standards District Office (FSDO) to take an airman knowledge test using one of the three options listed in preferential order:
   a. Option One. Use current testing facilities and procedures whenever possible.
   b. Option Two. Applicants may use Franklin Speaking Wordmaster® to facilitate the testing process. The Wordmaster® is a self-contained electronic thesaurus that audibly pronounces typed in words and presents them on a display screen. It has a built-in headphone jack for private listening. The headphone feature will be used during testing to avoid disturbing others.
   c. Option Three. Applicants who do not choose to use the first or second option may request a test proctor to assist in reading specific words or terms from the test questions and supplement material. In the interest of preventing compromise of the testing process, the test proctor should be someone who is non-aviation oriented. The test proctor will provide reading assistance only, with no explanation of words or terms. The Airman Testing Standards Branch, AFS-630, will assist in the selection of a test site and test proctor.

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 to take any airman knowledge test for 1 year.

Validity of Airman Test Reports

Airman Test Reports are valid for the 24-calendar month period preceding the month you complete the practical test. The validity period may be extended when application is made to take the oral and flight tests, if the following requirements are met:

1. Air Carrier Employees. The following criteria apply to flight crewmembers and mechanics employed by a 14 CFR Part 121 or 14 CFR Part 135 air carrier. Employment by a 14 CFR Part 135 on-demand operator does not qualify an applicant for an extension:
   a. Applicants who are flight crewmembers must have completed initial new-hire training, initial equipment training, or transition training.
   b. Applicants who are flight crewmembers must be participating in a training program which includes a recurrent training curriculum in accordance with 14 CFR Part 121 or 14 CFR Part 135.
   c. Applicants who are mechanics must meet the currency requirements of 14 CFR Part 65.
   d. Applicants must be currently employed by a 14 CFR Part 121 or a 14 CFR Part 135 air carrier. However, applicants do not need to have been continuously employed by a qualified air carrier between the time they passed the knowledge test and the time they apply to take the oral and flight tests.

2. Military Applicants. The following criteria apply to military applicants who apply for extensions on the basis of participation in a training program of a scheduled military transport service:
   a. Applicants must have participated in a flight engineer or maintenance training program at the time of passing the knowledge test or begun a flight engineer or maintenance training program within 24-calendar months after passing the knowledge test.
   b. Applicants must be currently participating in a military flight engineer or maintenance training program.

3. Continued Eligibility Documentation. Inspectors and examiners will not accept an expired Airman Test Report unless the applicant provides written evidence of continued eligibility. When satisfactory evidence is presented, the inspector or examiner will enter, date, and sign the following statement on the test report: "The period of validity of this form has been extended in accordance with the provisions of 14 CFR part 63, section 63.35(d)."

Eligibility Requirements for the Flight Engineer Certificate

Eligibility Requirements for the Knowledge Test

- The minimum age for taking the knowledge test is 19.
- A medical certificate is not required.
- Flight training in the duties of a flight engineer is not required.
- Applicants must be able to read, speak, and understand the English language.

The applicant must hold:

1. An unrestricted commercial pilot certificate with an instrument rating; or
2. An airline transport pilot certificate issued by the FAA or another International Civil Aviation Organization member nation; or
3. You may take the additional class rating knowledge test without further demonstration of eligibility if you possess a flight engineer certificate or an Airman Test Report for a flight engineer original class rating.
4. An FAA Form 8060-7, Airman's Authorization for Written Test. This form is issued by an FAA inspector upon the applicant's presenting satisfactory evidence of meeting one of the following practical experience requirements specified by 14 CFR §63.37:
   a. 14 CFR §63.37(b)(1). The applicant must have at least 3 years of diversified practical experience in aircraft and engine maintenance. At least 1 year of this experience must have been on multi-engine aircraft with engines that each have at least 800 horsepower, or the turbine engine equivalent.
   b. 14 CFR §63.37(b)(2). The applicant must have graduated from a 2-year aircraft and engine maintenance course, of which at least 6 months was devoted to the maintenance of aircraft, with engines that each have at least 800 horsepower, or the turbine engine equivalent.
   c. 14 CFR §63.37(b)(3). The applicant must hold a degree in aeronautical, electrical, or mechanical engineering and 6 months of practical experience in the maintenance of multi-engine aircraft, with engines that each have at least 800 horsepower, or the turbine engine equivalent.
   d. 14 CFR §63.37(b)(5). The applicant must have accumulated 200 hours of flight time as pilot in command, or second in command performing the functions of pilot in command, under the supervision of a pilot in command in an airplane certified in the transport category or a military airplane of equivalent weight and power, with at least two engines.
   e. 14 CFR §63.37(b)(6). The applicant must have at least 100 hours of flight time as a flight engineer.
   f. 14 CFR §63.37(b)(7). Within the previous 90 days, the applicant must have completed the ground portion of an approved Part 63, appendix C, flight engineer training course, for the class rating for which the application has been made.

Eligibility Requirements for the Oral and Flight Tests

The minimum age for the oral and flight tests is 19; however, to obtain a flight engineer certificate, the minimum age is 21. If you are less than 21 years of age and have successfully completed the oral and flight tests, you will be issued a letter of aeronautical competency. The letter will state that you have met all the requirements for a flight engineer certificate except for age.

When you present proof of reaching age 21, and a second-class medical certificate or better, the letter of aeronautical competency may be exchanged for a temporary airman certificate at any Flight Standards District Office (FSDO). The applicant must present a completed FAA Form 8400-3, Application for an Airman Certificate and/or Rating, including an authorized instructor's recommendation in box 7 of the form.

A current second-class medical certificate or better is required for taking the oral and flight tests.

Applicants must present a valid Airman Test Report.

The flight training must be completed in the airplane type which will be used for the tests. The minimum amount of flight training time is 5 hours for applicants qualifying under the provisions of 14 CFR Part 63, section 63.37(b) subparagraphs (1), (2), (3), (4) and (7). Applicants who qualify under the provisions of section 63.37(b) subparagraph (7) and hold a commercial pilot certificate or higher with an instrument rating may complete all their flight training in a simulator. There is no minimum amount of flight training time specified for applicants qualifying under the provisions of section 63.37(b) subparagraphs (5) and (6).

The applicant must present an authorized instructor's recommendation and verification of the instructor's eligibility to provide the endorsement, if retesting within 30 days after failing the oral or flight test.

For an additional class rating, the applicant must present his or her flight engineer certificate.

Test-Taking Tips

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

1. In order to maintain the integrity of each test, the FAA may rearrange the answer stems to appear in a different order on your test than you see in this book. For this reason, be careful to fully understand the intent of each question and corresponding answer while studying, rather than memorize the A, B, C answer choice.
2. Take with you to the testing center the eligibility evidence required, photo I.D., the testing fee, calculator, flight computer (ASA's E6-B or CX-2 Pathfinder), plotter, magnifying glass, and a sharp pointer, such as a safety pin.
3. Your first action when you sit down should be to write on the scratch paper the weight and balance and any other formulas and information you can remember from your study. Remember, some of the formulas may be on your E6-B.
4. Answer each question in accordance with the latest regulations and guidance publications.
5. Read each question carefully before looking at the possible answers. You should clearly understand the problem before attempting to solve it.
6. After formulating an answer, determine which answer choice corresponds the closest with your answer. The answer chosen should completely resolve the problem.
7. 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.
8. If a certain question is difficult for you, it is best to mark it for REVIEW and proceed to the other questions. After you answer the less difficult questions, return to those which you marked for review and answer them. Be sure to untag these questions once you've 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 procedure will enable you to use the available time to the maximum advantage.
9. 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.
10. When solving a calculation problem, select the answer nearest to your solution. The problem has been checked with various types of calculators; therefore, if you have solved it correctly, your answer will be closer to the correct answer than any of the other choices.
11. Remember that information is provided in the FAA Legends and FAA Figures.
12. Remember to answer every question, even the ones with no completely correct answer, to ensure the FAA gives you credit for a bad question.
13. Take your time and be thorough but relaxed. Take a minute off every half-hour or so to relax the brain and the body. Get a drink of water halfway through the test.

Suggested Materials for the Flight Engineer Certificate

The following are some of the publications recommended to study for the Flight Engineer FAA Knowledge tests. All are reprinted by ASA and available from authorized ASA dealers and distributors.

ASA-AC00-6A	*Aviation Weather*
ASA-AC00-45E	*Aviation Weather Services*
ASA-FR-AM-BK	*Federal Aviation Regulations and Aeronautical Information Manual* (combined)
ASA-8083-3	*Airplane Flying Handbook*
ASA-AC61-23C	*Pilot's Handbook of Aeronautical Knowledge*
ASA-8083-1	*Aircraft Weight and Balance Handbook*
ASA-ANA	*Aerodynamics for Naval Aviators*
ASA-AC65-12A	*Airframe and Powerplant Mechanics Powerplant Handbook*
ASA-AC65-15A	*Airframe and Powerplant Mechanics Airframe Handbook*
ASA-AC65-9A	*Airframe and Powerplant Mechanics General Handbook*
ASA-FAR-AMT	*Federal Aviation Regulations: Aviation Maintenance Technicians*
ASA-FAR-FC	*Federal Aviation Regulations: Flight Crew* (Parts 1, 25, 63, 65, and 121)
ASA-8081-21	*Flight Engineer Practical Test Standards*
ASA-TW-ATP-FE	Prepware Exam Software for Flight Engineers and Airline Transport Pilots

Visit the ASA website for more information on all these products: **www.asa2fly.com**

ASA Test Prep Layout

The FAA questions have been sorted into chapters according to subject matter. Within each chapter, the questions have been further classified and all similar questions grouped together with a concise discussion of the material covered in each group. This discussion material of "Chapter text" is printed in a larger font and spans the entire width of the page. Immediately following the FAA Question is ASA's Explanation in *italics*. The last line of the Explanation contains the Subject Matter Knowledge Code and further reference (if applicable). *See* the EXAMPLE below.

Figures referenced by the Chapter text only are numbered with the appropriate chapter number, i.e., "Figure 1-1" is Chapter 1's first chapter-text figure.

Some FAA Questions refer to Figures or Legends immediately following the question number, i.e., "1201. (Refer to Figure 14.)." These are FAA Figures and Legends which can be found in the separate booklet: *Computerized Testing Supplement* (CT-8080-XX). This supplement is bundled with the Test Prep and is the exact material you will have access to when you take your computerized test. We provide it separately, so you will become accustomed to referring to the FAA Figures and Legends as you would during the test.

Figures referenced by the Explanation and pertinent to the understanding of that particular question are labeled by their corresponding Question number. For example: the caption "Questions 1245 and 1248" means the figure accompanies the Explanations for both Question 1245 and 1248.

Answers to each question are found at the bottom of each page, and in the Cross-Reference at the back of this book.

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, FET, FEN, FEX

1201. (Refer to Figure 14.) The four forces acting on an airplane in flight are

See separate book: *Computerized Testing Supplement* (CT-8080-XX)

A— lift, weight, thrust, and drag.
B— lift, weight, gravity, and thrust.
C— lift, gravity, power, and friction.

FAA question and answer choices

Lift, weight, thrust, and drag are the four basic aerodynamic forces acting on an aircraft in flight.
(H300) — AC 61-23C, Chapter 1

Explanation

Code line. FAA's Subject Matter Knowledge Code in parentheses, followed by further references where applicable.

Answer (B) is incorrect because a power increase for takeoff is only ensured with the proper amount of ADI fluid. Answer (C) is incorrect because if too little, not too much, ADI is injected, the engine could overheat and experience detonation.

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 flight engineer ratings **FEX=Turbojet and Basic** **FET=Turboprop and Basic** **FEN=Reciprocating and Basic**

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