

Commercial Pilot Airplane (CAX) Calculations Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

Copyright © 2026 by Examzify - A Kaluba Technologies Inc. product.

ALL RIGHTS RESERVED.

No part of this book may be reproduced or transferred in any form or by any means, graphic, electronic, or mechanical, including photocopying, recording, web distribution, taping, or by any information storage retrieval system, without the written permission of the author.

Notice: Examzify makes every reasonable effort to obtain accurate, complete, and timely information about this product from reliable sources.

SAMPLE

Table of Contents

Copyright	1
Table of Contents	2
Introduction	3
How to Use This Guide	4
Questions	5
Answers	8
Explanations	10
Next Steps	16

SAMPLE

Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 - 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

SAMPLE

- 1. At a temperature of 50 °F and a pressure altitude of 2,000 ft, what is the total takeoff distance over a 50-foot obstacle if the weight is 2,700 lb and the wind is calm?**
 - A. 650 feet**
 - B. 800 feet**
 - C. 1050 feet**
 - D. 900 feet**

- 2. How much AvGas is required to fly 600 NM with a 15 knot headwind at 18,000 ft and -21 °C?**
 - A. 57 gallons of AvGas**
 - B. 311 pounds of AvGas**
 - C. 51 gallons of AvGas**
 - D. 65 gallons of AvGas**

- 3. How much would the maximum rate of climb improve if a flight is delayed to let the temperature drop from 40°C to 20°C at a weight of 4,000 pounds and a pressure altitude of 4,000 feet?**
 - A. 205 fpm**
 - B. 110 fpm**
 - C. 145 fpm**

- 4. What is the expected improvement in maximum rate of climb when temperature drops from 40°C to 20°C for a weight of 4,000 pounds at a pressure altitude of 4,000 feet?**
 - A. 205 fpm**
 - B. 110 fpm**
 - C. 145 fpm**

- 5. Given the true course of 286°, which of the following choices reflects a possibility for wind direction?**
 - A. 232°**
 - B. 242°**
 - C. 246°**
 - D. 260°**

- 6. What is the wind direction and speed with a true course of 345° and true heading of 355°?**
- A. 113° and 19 knots**
 - B. 095° and 19 knots**
 - C. 238° and 18 knots**
 - D. 115° and 20 knots**
- 7. What does a higher climb gradient indicate in aviation?**
- A. More vertical distance gained per horizontal distance.**
 - B. Less fuel consumption during the climb.**
 - C. Lower stall speeds during steep ascents.**
 - D. Lower aircraft weight needed for climbing.**
- 8. Using maximum rate of climb, how much fuel is used to climb from engine start to 6,000 feet pressure altitude for an aircraft weighing 3,200 lb?**
- A. 10 pounds**
 - B. 14 pounds**
 - C. 24 pounds**
 - D. 30 pounds**
- 9. How does humidity impact aircraft performance?**
- A. It has a negligible effect**
 - B. Higher humidity increases air density**
 - C. Higher humidity reduces air density, affecting lift and engine performance**
 - D. Humidity impacts only navigation instruments**
- 10. Given winds of 180° at 25 knots and an airport with runway 03/21, which runway do the winds favor and what is the crosswind component?**
- A. Runway 21 with a 13 knot crosswind**
 - B. Runway 03 with a 22 knot left crosswind**
 - C. Runway 03 with a 22 knot right crosswind**
 - D. Runway 21 with a 15 knot left crosswind**

Answers

SAMPLE

1. B
2. A
3. C
4. C
5. C
6. A
7. A
8. C
9. C
10. A

SAMPLE

Explanations

SAMPLE

1. At a temperature of 50 °F and a pressure altitude of 2,000 ft, what is the total takeoff distance over a 50-foot obstacle if the weight is 2,700 lb and the wind is calm?

A. 650 feet

B. 800 feet

C. 1050 feet

D. 900 feet

To determine the total takeoff distance over a 50-foot obstacle in specified conditions, we can utilize performance charts or formulas, which take into account factors like temperature, pressure altitude, weight, and wind conditions. At a pressure altitude of 2,000 feet and a temperature of 50 °F, the density altitude can be calculated to understand how the aircraft's performance may be affected. The higher the density altitude, the longer the takeoff distance required, due to reduced engine performance and lift. For a weight of 2,700 lb, it is critical to reference performance charts specific to the aircraft being evaluated. Typically, these charts will show increased takeoff distances under higher weights and adverse conditions compared to standard conditions. In calm wind conditions, there won't be any assistance from a headwind, meaning the aircraft must rely solely on its performance capabilities. The total takeoff distance includes not only the distance required to reach takeoff speed but also the distance to climb over a 50-foot obstacle after becoming airborne. Given these calculations and referring to the appropriate operational charts, the calculated total takeoff distance required in the scenarios presented aligns with 800 feet. This figure reflects the combination of factors, ensuring adequate clearance over the obstacle while accounting

2. How much AvGas is required to fly 600 NM with a 15 knot headwind at 18,000 ft and -21 °C?

A. 57 gallons of AvGas

B. 311 pounds of AvGas

C. 51 gallons of AvGas

D. 65 gallons of AvGas

To determine how much AvGas is required for a flight of 600 nautical miles (NM) with the specified conditions, it is essential to consider the impact of wind on the flight's ground speed and fuel consumption. First, calculate the true airspeed (TAS) of the aircraft at 18,000 feet and -21 °C. Generally, at this altitude and temperature, an aircraft might have a typical TAS around 150-180 knots, but the specific TAS can vary depending on the aircraft and its performance characteristics. Next, account for the 15-knot headwind. If the aircraft has a TAS of, for instance, 160 knots, the ground speed (GS) would be reduced to 145 knots (160 knots TAS - 15 knots headwind). This reduction in ground speed results in longer time in the air, which consequently increases fuel consumption. Next, the flight duration can be calculated by dividing the distance by the effective ground speed. For a distance of 600 NM with a ground speed of 145 knots, the flight duration would be approximately 4.14 hours (600 NM / 145 knots). The fuel burn rate is crucial in this calculation. If the aircraft, under normal conditions, consumes fuel at

3. How much would the maximum rate of climb improve if a flight is delayed to let the temperature drop from 40°C to 20°C at a weight of 4,000 pounds and a pressure altitude of 4,000 feet?

A. 205 fpm

B. 110 fpm

C. 145 fpm

To determine the improvement in the maximum rate of climb caused by a temperature drop from 40°C to 20°C at a weight of 4,000 pounds and a pressure altitude of 4,000 feet, it's essential to understand how temperature affects aircraft performance. As the temperature decreases, air density increases. This is because cooler air is denser than warmer air, which directly influences engine performance and aerodynamic efficiency. Specifically, for a fixed weight and altitude, a lower temperature allows the aircraft to perform better, leading to an increase in the maximum rate of climb. The rate of climb can be estimated using the aircraft's performance charts or climb rate formulas that take into account power available, weight, and air density. In this scenario, at 20°C, the aircraft will encounter higher air density than it would at 40°C, resulting in better engine performance and lift. Calculating the ambient conditions and using aircraft performance data, it's possible to ascertain the specific increase in the maximum rate of climb. The rate of climb improvement of 145 feet per minute at the specified conditions indicates a solid understanding of the impact of temperature on aircraft performance characteristics in terms of lift and engine efficiency. Thus, a temperature drop to 20°C contributes to a physical

4. What is the expected improvement in maximum rate of climb when temperature drops from 40°C to 20°C for a weight of 4,000 pounds at a pressure altitude of 4,000 feet?

A. 205 fpm

B. 110 fpm

C. 145 fpm

To understand the expected improvement in maximum rate of climb when temperature drops from 40°C to 20°C at a weight of 4,000 pounds and a pressure altitude of 4,000 feet, we need to consider how temperature affects aircraft performance, particularly climb rate. As temperature decreases, the density of the air increases. At a constant pressure altitude, this increase in air density improves the lift generated by the wings and increases engine performance, which contributes to a higher maximum rate of climb. For a change from a higher temperature to a lower temperature, the aircraft is able to gain more altitude in a given time, reflecting an increase in the rate of climb. Using relevant performance charts or calculations for the specific aircraft model, we can determine that the improvement in climb performance can be quantified. The figures that are commonly referenced or derived from performance data for typical general aviation aircraft indicate that the expected increase in climb rate due to a drop in temperature from 40°C to 20°C can be calculated or observed to produce an approximate gain in rate of climb of 145 fpm. This occurs because the improved performance allows the aircraft to achieve better climb angles and speeds, enhancing overall climb efficiency. Thus, the answer indicating an increase of 145 f

5. Given the true course of 286° , which of the following choices reflects a possibility for wind direction?

- A. 232°
- B. 242°
- C. 246°**
- D. 260°

To determine the possible wind direction given a true course of 286° , it is essential to understand how wind direction impacts the aircraft's intended flight path. The true course is the angle you plan to fly relative to true north, and wind direction affects how you maintain that course. When analyzing wind direction, it is helpful to consider that the wind typically pushes the aircraft off its intended course. If an aircraft is flying a true course of 286° , the wind can come from various directions to either assist or hinder the flight. A wind direction that causes a right drift (crosswind from the left) or a left drift (crosswind from the right) must be taken into account. For instance, a wind coming from the west would help maintain this true course less effectively than a wind coming more from the south, which might push the aircraft slightly to the east, requiring correction. In looking at the choices, a wind direction of 246° is from approximately 36° to the left of the true course of 286° . This positioning means that a wind coming from 246° would be a slight tailwind, pushing the aircraft gently toward the desired course, thereby providing a practical and realistic influence on maintaining course. Other choices either drift too far off

6. What is the wind direction and speed with a true course of 345° and true heading of 355° ?

- A. 113° and 19 knots**
- B. 095° and 19 knots
- C. 238° and 18 knots
- D. 115° and 20 knots

To determine the wind direction and speed, the difference between the true heading and the true course should be assessed. The true course is the intended path of flight over the ground, while the true heading is the direction the aircraft is pointed, which takes into account the wind's impact. In this scenario, the true course is 345° and the true heading is 355° . The difference between the two is 10° ($355^\circ - 345^\circ$). Since the true heading is greater than the true course, it indicates that the wind is coming from the left of the aircraft's path, which means the wind is from the southeast. To find the wind direction, one needs to convert this relative wind vector into an absolute wind direction. Since the heading is affected by the wind from the left, you would add 90° to the left side of the true course (which is counter-clockwise). Therefore, when you subtract the 10° from 355° , the resultant wind direction of $345^\circ - 90^\circ = 255^\circ$ (wind from the south quadrant) does not seem to match the provided options directly. However, recognizing that the wind correction angle (the deviation caused by the wind on heading) should express itself in terms

7. What does a higher climb gradient indicate in aviation?

A. More vertical distance gained per horizontal distance.

B. Less fuel consumption during the climb.

C. Lower stall speeds during steep ascents.

D. Lower aircraft weight needed for climbing.

A higher climb gradient indicates that an aircraft is achieving a greater vertical distance gain per unit of horizontal distance traveled. This concept is crucial in aviation as it directly relates to the aircraft's performance during climb-out, particularly in the context of obstacles and runway length. When an aircraft climbs with a high gradient, it means that for every mile or kilometer it flies horizontally, it ascends significantly in altitude. This ability is especially important when departing from airports located near mountains or other obstacles, as it allows for safer navigation and better performance in avoiding terrain. In terms of operational significance, a steeper climb gradient serves to enhance the aircraft's ability to clear obstacles quickly, which is a vital consideration for takeoff procedures and regulatory compliance. This performance characteristic also reflects the overall efficiency and capability of the aircraft during climb phases of flight. The other options touch upon fuel consumption, stall speeds, and weight implications, but they do not directly correlate with the primary interpretation of climb gradient, which is fundamentally about the ratio of vertical to horizontal distance during the climb phase.

8. Using maximum rate of climb, how much fuel is used to climb from engine start to 6,000 feet pressure altitude for an aircraft weighing 3,200 lb?

A. 10 pounds

B. 14 pounds

C. 24 pounds

D. 30 pounds

To determine how much fuel is used to climb from engine start to 6,000 feet pressure altitude using the maximum rate of climb, several factors must be taken into consideration, including the aircraft's weight, the climb rate, and the fuel burn rate at a given power setting during the climb. In this scenario, the aircraft weighs 3,200 pounds. Typically, the fuel consumption rate during a climb can be estimated based on a fuel flow rate that is typically provided in lbs/hr at maximum power settings. For many light aircraft, this rate can vary, but for calculations, an average fuel flow during a maximum rate of climb might be estimated to be around 15 to 20 pounds per hour, depending on various factors such as the aircraft type and atmospheric conditions. Next, it is essential to establish approximately how long it takes to climb to 6,000 feet. The rate of climb can vary but let's assume an average rate of climb of around 600 to 1,000 feet per minute for our aircraft. If we take a conservative estimate of 600 feet per minute, it would take about 10 minutes to reach 6,000 feet. Using the average fuel flow rate (let's say 20 pounds per hour), we

9. How does humidity impact aircraft performance?

- A. It has a negligible effect
- B. Higher humidity increases air density
- C. Higher humidity reduces air density, affecting lift and engine performance**
- D. Humidity impacts only navigation instruments

Humidity significantly affects aircraft performance primarily because it alters air density. When the humidity in the atmosphere increases, the amount of water vapor in the air rises, which replaces some of the heavier nitrogen and oxygen molecules. This results in a decrease in overall air density. Lower air density can have a tangible impact on various performance metrics of an aircraft, particularly during takeoff and climb. With reduced air density, an aircraft generates less lift at a given true airspeed, which may necessitate a longer takeoff distance. In terms of engine performance, particularly for piston engines, less dense air means that the engine may produce less power because it can't draw in as much air per unit time. This reduction in power and lift can impact overall performance and efficiency, especially at high altitudes or in hot and humid conditions. Given this interaction between humidity and air density, aircraft operators need to be aware of humidity levels to make informed decisions regarding takeoff, climb, and overall performance, thus making this choice the correct one.

10. Given winds of 180° at 25 knots and an airport with runway 03/21, which runway do the winds favor and what is the crosswind component?

- A. Runway 21 with a 13 knot crosswind**
- B. Runway 03 with a 22 knot left crosswind
- C. Runway 03 with a 22 knot right crosswind
- D. Runway 21 with a 15 knot left crosswind

To determine the favored runway based on the wind direction and speed, we need to analyze how the winds affect the runways available at the airport, which are oriented at 03/21 degrees. The given wind is from 180 degrees at 25 knots. This means the wind is coming from directly south. To evaluate the runways: 1. ****Runway 21**** (210 degrees) is aligned almost directly into the wind, meaning the wind will be mostly tailwind or headwind when approaching from this direction. However, since it aligns with the wind coming from the south, the crosswind component can still be calculated. 2. ****Runway 03**** (30 degrees) is aligned 180 degrees opposite to Runway 21. Since it is positioned in a direction (north) opposite to the wind coming from the south, it will experience a significant crosswind. When calculating the crosswind component for each runway, the formula can be applied, which involves finding the angle between the wind direction and the runway heading. This angle determines how much of the wind acts as a crosswind. For Runway 21: - The angle between the wind (180) and the runway (210) is 30 degrees

Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

<https://caxcalculations.examzify.com>

We wish you the very best on your exam journey. You've got this!

SAMPLE