

FAA Aviation Physics Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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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

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- 1. What is the primary effect of a misaligned control surface?**
 - A. Improved lift generation**
 - B. Increased fuel efficiency**
 - C. Uncontrolled aircraft movement**
 - D. Enhanced stability**

- 2. How much work did Lindsay do when she applied a 5 N force to a shopping cart for 16 meters?**
 - A. 80 joules**
 - B. 90 joules**
 - C. 100 joules**
 - D. 70 joules**

- 3. How much work is required to lower a 120-pound weight from a height of 3 feet?**
 - A. 120 foot pounds**
 - B. 240 foot pounds**
 - C. 360 foot pounds**
 - D. 480 foot pounds**

- 4. At what temperature does sound travel fastest in air?**
 - A. 0 degrees Celsius**
 - B. 20 degrees Celsius**
 - C. 30 degrees Celsius**
 - D. 100 degrees Celsius**

- 5. What principle allows a lever to reduce the effort force needed to lift a load?**
 - A. The mechanical advantage**
 - B. The conservation of energy**
 - C. The weight distribution**
 - D. The angle of elevation**

- 6. Which aspect of fluid dynamics is crucial for understanding liquid flow in aviation systems?**
- A. Viscosity**
 - B. Density**
 - C. Thermal conductivity**
 - D. Surface tension**
- 7. Which of the following best describes how acceleration is calculated?**
- A. Acceleration = Final Speed - Initial Speed**
 - B. Acceleration = (Final Speed + Initial Speed) / Time**
 - C. Acceleration = (Final Speed - Initial Speed) / Time**
 - D. Acceleration = Final Speed × Time**
- 8. Which atmospheric characteristic influences the speed of sound?**
- A. Humidity**
 - B. Pressure**
 - C. Temperature**
 - D. Density**
- 9. Which principle explains the thrust produced by a jet engine?**
- A. Bernoulli's principle**
 - B. Newton's third law of motion**
 - C. Archimedes' principle**
 - D. Conservation of momentum**
- 10. What is the equation for calculating work in a scenario involving force and distance?**
- A. Work = Force + Distance**
 - B. Work = Force x Distance**
 - C. Work = Force - Distance**
 - D. Work = Distance / Force**

Answers

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

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Explanations

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1. What is the primary effect of a misaligned control surface?
- A. Improved lift generation
 - B. Increased fuel efficiency
 - C. Uncontrolled aircraft movement**
 - D. Enhanced stability

A misaligned control surface primarily leads to uncontrolled aircraft movement. Control surfaces, such as ailerons, elevators, and rudders, are crucial for maneuvering the aircraft and maintaining stability in flight. When these surfaces are not aligned properly, they cannot effectively control the aircraft's attitude or trajectory, resulting in unexpected and potentially dangerous movements. For instance, an aileron that is misaligned could cause one wing to create more lift than the other, leading to rolling motions that the pilot did not intend. Similarly, a misaligned elevator can make it difficult to maintain level flight or to control pitch effectively. Thus, the lack of proper control can create a situation where the aircraft may veer off its intended flight path, making this option the most accurate choice regarding the consequences of a misaligned control surface.

2. How much work did Lindsay do when she applied a 5 N force to a shopping cart for 16 meters?
- A. 80 joules
 - B. 90 joules**
 - C. 100 joules
 - D. 70 joules

To determine the work done when a force is applied to an object, the formula to use is $\text{work} = \text{force} \times \text{distance}$. In this case, Lindsay applied a force of 5 newtons over a distance of 16 meters. Using the formula, the calculation is as follows: $\text{Work} = \text{Force} \times \text{Distance}$ $\text{Work} = 5 \text{ N} \times 16 \text{ m}$ $\text{Work} = 80 \text{ joules}$ Thus, the correct calculation shows that Lindsay did 80 joules of work on the shopping cart. This aligns with the physical concept of work, which is defined as the product of the force and the distance over which that force is applied in the same direction. The incorrect answer indicates a misunderstanding, possibly from miscalculating the force and distance or utilizing the formula incorrectly. Understanding the relationship between force, distance, and work is crucial in physics, especially in practical applications like this one.

3. How much work is required to lower a 120-pound weight from a height of 3 feet?

- A. 120 foot pounds**
- B. 240 foot pounds**
- C. 360 foot pounds**
- D. 480 foot pounds**

To determine the amount of work required to lower a weight, we can apply the formula for work done against gravity, which is given by the product of weight and the height from which it is lowered. In this scenario, the weight being lowered is 120 pounds and it is being lowered from a height of 3 feet. The work done can be calculated by multiplying the weight by the height: $\text{Work} = \text{Weight} \times \text{Height}$. Substituting the values we have: $\text{Work} = 120 \text{ pounds} \times 3 \text{ feet} = 360 \text{ foot-pounds}$. This calculation shows that the total work required to lower the weight 3 feet is 360 foot-pounds. This aligns with the chosen answer, indicating that the calculation and application of the work-energy principle in this context is sound and correctly reflects the physics involved. Other choices do not match this calculation, as they either misrepresent the multiplication of the weight and height or involve different contexts unrelated to the scenario presented. Thus, the answer of 360 foot-pounds accurately represents the work done in lowering the weight.

4. At what temperature does sound travel fastest in air?

- A. 0 degrees Celsius**
- B. 20 degrees Celsius**
- C. 30 degrees Celsius**
- D. 100 degrees Celsius**

Sound travels fastest in air at higher temperatures because sound waves are transmitted through the vibration of air molecules. As the temperature increases, the average kinetic energy of the air molecules also increases, which means they move more quickly. This increased speed of molecular movement allows sound waves to propagate faster through the medium, as the molecules can transfer the vibrational energy more efficiently. At 100 degrees Celsius, air molecules are moving significantly faster than at lower temperatures, resulting in an increased speed of sound compared to 0, 20, or 30 degrees Celsius. The relationship between temperature and the speed of sound in air can be described by the equation that accounts for the temperature in degrees Kelvin, emphasizing that as temperature rises, so does the speed of sound. Therefore, the fastest travel of sound in air occurs at 100 degrees Celsius.

5. What principle allows a lever to reduce the effort force needed to lift a load?

- A. The mechanical advantage**
- B. The conservation of energy**
- C. The weight distribution**
- D. The angle of elevation**

A lever operates based on the principle of mechanical advantage, which allows a smaller effort force to lift a larger load. Mechanical advantage is achieved by increasing the distance from the fulcrum (the pivot point of the lever) where the effort is applied compared to the distance from the fulcrum to the load. This relationship enables the effort force to be effectively amplified. For example, when using a lever, if the effort is applied farther from the fulcrum than the load is, the lever can lift the load by using less force than would be required to lift the load directly. This is a fundamental concept in physics, demonstrating how levers can make lifting heavy objects easier by redistributing force through distances. The other concepts listed do not specifically explain this function. The conservation of energy pertains to the principle that energy cannot be created or destroyed, but it does not directly address how levers operate. Weight distribution relates more to how mass is spread over an area rather than the mechanics of lifting. The angle of elevation can influence the effectiveness of certain mechanical systems, but it does not encapsulate the core principle of how a lever achieves its efficiency in reducing effort force.

6. Which aspect of fluid dynamics is crucial for understanding liquid flow in aviation systems?

- A. Viscosity**
- B. Density**
- C. Thermal conductivity**
- D. Surface tension**

Viscosity is fundamentally important for understanding how liquids flow in aviation systems. It refers to the internal friction within a fluid that affects its ability to flow. In aviation, various fluids such as fuels, hydraulic fluids, and lubricants need to flow efficiently through pipes, pumps, and other components of the systems. Higher viscosity indicates a thicker fluid that flows more slowly, which can impact how these systems operate, especially under different temperature and pressure conditions typical in aviation environments. Understanding viscosity allows engineers and technicians to predict how these fluids will behave under different conditions, ensuring that they can select the appropriate fluids for specific applications and maintain system performance. For example, a fluid with too high a viscosity at low temperatures may not flow adequately, leading to mechanical failures or inefficient operation of systems. Other aspects like density, thermal conductivity, and surface tension also play roles in fluid dynamics but are not as directly impactful on liquid flow behavior as viscosity. Density is more about mass per unit volume, affecting buoyancy and weight considerations rather than the flow characteristics. Thermal conductivity relates to how well a fluid can conduct heat, which is essential in thermal management but does not dictate flow behavior. Surface tension influences the interaction of liquids with surfaces and behaviors in small volumes but has less relevance in the

7. Which of the following best describes how acceleration is calculated?

- A. Acceleration = Final Speed - Initial Speed
- B. Acceleration = (Final Speed + Initial Speed) / Time
- C. Acceleration = (Final Speed - Initial Speed) / Time**
- D. Acceleration = Final Speed × Time

Acceleration is defined as the change in velocity over time. In mathematical terms, acceleration calculates how quickly an object's velocity changes, encompassing both speed and direction. The correct formula for this calculation is: Acceleration = (Final Speed - Initial Speed) / Time. This formula indicates that acceleration is determined by taking the difference between the final speed and the initial speed—representing the change in speed—and then dividing that difference by the time period over which the change occurs. This provides the rate of speed change, measured in units of velocity per unit of time, such as meters per second squared (m/s²). The other options do not accurately define the relationship between speed, change in speed, and time, either by omitting the necessary division by time or misrepresenting the way speed change should be calculated. Understanding this formula is crucial for analyzing motion in physics, particularly in the context of aviation and the principles of flight dynamics.

8. Which atmospheric characteristic influences the speed of sound?

- A. Humidity
- B. Pressure
- C. Temperature**
- D. Density

The speed of sound in the atmosphere is primarily influenced by temperature. As the temperature increases, the speed of sound also increases. This relationship occurs because sound waves travel through the air by causing particles to vibrate and pass energy from one particle to another. When air is warmer, the particles have higher kinetic energy and move more rapidly. This increased motion allows sound waves to propagate more quickly. In contrast, at lower temperatures, the kinetic energy of air molecules decreases, which slows down the transmission of sound waves, resulting in a lower speed of sound. While other factors such as humidity, pressure, and density can have some effect on the speed of sound, the most significant and direct relationship is with temperature. For instance, at a constant pressure, changes in humidity may slightly affect sound speed due to variations in the density of humid air compared to dry air. Similarly, while pressure can influence the speed of sound when temperature is held constant, in the atmosphere, temperature is the dominant factor, and thus the speed of sound changes primarily with fluctuations in temperature.

9. Which principle explains the thrust produced by a jet engine?

- A. Bernoulli's principle
- B. Newton's third law of motion**
- C. Archimedes' principle
- D. Conservation of momentum

The principle that explains the thrust produced by a jet engine is Newton's third law of motion, which states that for every action, there is an equal and opposite reaction. In the context of a jet engine, when the engine expels exhaust gases backward at high speed, it creates a forward thrust. This occurs because the action of pushing the gases backward results in the reaction of the aircraft being pushed forward. In a jet engine, atmospheric air enters the engine, mixes with fuel, and is ignited. The combustion generates high-speed exhaust gases that exit the engine through the nozzle. The force of these gases moving in one direction (backward) leads to a force that propels the engine and the aircraft in the opposite direction (forward). This direct relationship between the expelled gases and the resulting thrust is a perfect application of Newton's third law. The other principles, while important in different contexts, do not exclusively explain the thrust generation of jet engines. Bernoulli's principle pertains to fluid dynamics and the relationship between velocity and pressure of a fluid, which helps explain lift but is not specifically responsible for thrust. Archimedes' principle deals with buoyancy in fluids and is not applicable to jet propulsion. Conservation of momentum relates to the change in velocity

10. What is the equation for calculating work in a scenario involving force and distance?

- A. Work = Force + Distance
- B. Work = Force x Distance**
- C. Work = Force - Distance
- D. Work = Distance / Force

The equation for calculating work in a scenario involving force and distance is derived from the definition of work in physics. Work is defined as the energy transferred when a force is applied to an object, causing it to move over a distance. The mathematical expression for this relationship is: $Work = Force \times Distance$. In this equation, work is measured in joules (J), force in newtons (N), and distance in meters (m). The multiplication of force and distance indicates that work increases when either the force applied increases or the distance over which the force is applied increases. This reflects the notion that the more force you exert or the farther you move the object, the more work is done. The other choices do not reflect the correct relationship defined by the concept of work in physics. For example, adding force and distance does not have a physical meaning in this context, while subtracting distance from force or dividing distance by force also fails to represent the fundamental principle that dictates how work is calculated. Thus, the correct equation of work being equal to the product of force and distance is essential for accurate calculations related to energy transfer.

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://faaaviationphysics.examzify.com>

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

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