ANSWER KEYS AP STATS Handbook

answer keys ap stats are an essential resource for students preparing for the AP Statistics exam. These answer keys provide correct solutions and explanations to practice questions, helping students assess their understanding, identify areas for improvement, and build confidence ahead of the test day. Whether you?re reviewing practice exams, homework assignments, or sample questions, having access to accurate answer keys can significantly enhance your study process. In this comprehensive guide, we will explore everything you need to know about AP Stats answer keys?from their importance and how to use them effectively to where to find reliable resources online.

The Importance of Answer Keys in AP Statistics Preparation

Understanding the significance of answer keys in your study routine is crucial. They serve multiple purposes that can boost your performance and mastery of statistical concepts.

1. Self-Assessment and Progress Tracking

Answer keys allow students to evaluate their work critically. By comparing your solutions with the correct answers, you can:

- Identify mistakes and misconceptions
- Track improvement over time
- Focus your review on weak areas

2. Clarifying Concepts and Methods

Examining the detailed solutions provided in answer keys helps deepen understanding. They often include step-by-step explanations that clarify:

- Statistical reasoning processes
- Calculations and formulas applied
- Interpretation of results in context

3. Building Exam Confidence

Regularly practicing with answer keys familiarizes students with the exam format and question

styles, reducing anxiety and increasing confidence.

How to Use AP Stats Answer Keys Effectively

Using answer keys optimally requires strategic planning. Here are some tips to maximize their benefits:

1. Attempt Practice Questions First

Always try to solve questions independently before consulting the answer key. This ensures you genuinely engage with the material and develop problem-solving skills.

2. Review Mistakes Thoroughly

After checking your answers, analyze errors to understand why you made them. Pay attention to:

- Misconceptions in statistical reasoning
- Calculation errors
- Misinterpretation of questions

3. Study the Explanations Carefully

Many answer keys include detailed solutions. Use these explanations to learn effective strategies, alternative methods, and common pitfalls.

4. Create a Mistake Log

Keep track of questions you answered incorrectly and review them regularly. This targeted practice can help solidify your understanding.

5. Use Answer Keys as a Study Tool, Not Just a Check

Integrate answer keys into your overall study plan by solving additional similar problems, practicing with flashcards, or participating in study groups.

Where to Find Reliable AP Stats Answer Keys

Access to accurate and high-quality answer keys is vital. Here are some trusted sources:

1. College Board Official Resources

The College Board, which administers the AP exams, provides official practice exams and answer keys on their website. These resources are the most reliable and reflect the current exam format.

2. AP Statistics Textbooks

Many AP Statistics textbooks include end-of-chapter answer keys and supplementary practice tests. Examples include:

- ?The Practice of Statistics? by Starnes, Tabor, Yates, and Moore
- ?AP Statistics? by David S. Moore

3. Online Educational Platforms and Websites

Numerous reputable sites offer practice questions with answer keys, such as:

- Khan Academy (https://www.khanacademy.org)
- Albert.io (https://www.albert.io)
- Varsity Tutors and other tutoring sites

4. AP Prep Books and Study Guides

Popular prep books often include extensive practice sections with answer keys, including:

- Barron?s AP Statistics
- Princeton Review?s Cracking the AP Stats Exam
- 5 Steps to a 5: AP Statistics

Tips for Creating Your Own Answer Key Resources

While relying on existing answer keys is helpful, creating your own can reinforce learning. Here?s how:

1. Record Practice Questions

Keep a notebook or digital document with questions you encounter during practice sessions.

2. Write Down Correct Solutions

After solving each question, write out the detailed solution, referencing official answer keys or textbooks.

3. Annotate Common Mistakes

Note any errors or misconceptions to avoid repeating them.

4. Use Your Custom Answer Key for Review

Periodically revisit your notes to reinforce your understanding and identify patterns in mistakes.

Additional Resources for AP Stats Practice and Answer Keys

Beyond official and textbook resources, consider enrolling in online courses or joining study groups that provide practice exams with answer keys. Many teachers and tutors also offer customized practice sets with detailed solutions.

1. Practice Exams from Past Years

Downloading past AP exam questions and answer keys from the College Board website offers authentic practice.

2. Online Forums and Communities

Platforms like Reddit?s AP Student subreddit or College Confidential can offer insights, shared resources, and peer explanations.

3. Mobile Apps and Software

Apps such as AP Statistics Prep or Quizlet often contain flashcards, practice questions, and answer keys for quick review.

Conclusion

Mastering AP Statistics requires consistent practice, understanding core concepts, and effective review strategies. Answer keys are invaluable tools that enable students to assess their work, understand solutions, and improve their statistical reasoning skills. By utilizing official resources, reputable online platforms, and creating personalized study materials, students can enhance their preparation and increase their chances of achieving a high score. Remember, the goal is not just to memorize answers but to understand the underlying principles, so use answer keys as guides for deeper learning and mastery of AP Stats.

Answer Keys AP Stats: An In-Depth Examination of Their Role, Reliability, and Ethical Implications

In the realm of Advanced Placement (AP) Statistics, students and educators alike grapple with the challenges of mastering complex concepts, interpreting data, and preparing effectively for exams. A topic that often surfaces in discussions about exam preparation is the use of answer keys AP Stats. These resources?whether official or unofficial?serve as critical tools for review, self-assessment, and understanding exam expectations. However, their usage raises important questions about reliability, ethical considerations, and their impact on learning outcomes. This article explores the multifaceted role of answer keys in AP Statistics, analyzing their benefits, risks, and best practices for responsible use.

The Significance of Answer Keys in AP Stats Preparation

Answer keys, in the context of AP Statistics, are documents or digital resources that provide correct solutions to practice questions, sample problems, and past exam items. They serve as a benchmark for students aiming to gauge their understanding, identify knowledge gaps, and refine problem-solving techniques.

Official vs. Unofficial Answer Keys

- Official Answer Keys: Released by the College Board, these are considered the most reliable resources. They accompany released exams, scoring guidelines, and sample questions. Their accuracy aligns with the scoring criteria and question intent.

- Unofficial Answer Keys: Created by third-party educators, tutors, or online communities, these may vary in accuracy. They often appear on educational websites, forums, or shared via social media, and sometimes include explanations, hints, or partial solutions.

Benefits of Using Answer Keys AP Stats

- Self-Assessment: Students can compare their solutions with correct answers to evaluate their understanding.

- Targeted Practice: Identifying specific question types or topics where errors occur helps tailor study strategies.

- Confidence Building: Familiarity with question formats and solutions reduces test anxiety.

- Time Management: Practicing with answer keys allows students to simulate exam conditions and improve pacing.

Limitations and Risks

- Over-Reliance: Excessive dependence on answer keys might inhibit the development of problem-solving skills.

- Potential for Misleading Resources: Unverified answer keys may contain errors, misleading students and hampering learning.

- Encouraging Academic Dishonesty: Using answer keys improperly or sharing answers during assessments can undermine academic integrity.

Analyzing the Reliability and Accuracy of Answer Keys in AP Stats

Given the stakes associated with AP exams, the accuracy of answer keys is paramount. A flawed answer key can lead to misconceptions, incorrect self-assessment, and ultimately, poorer performance.

The Role of Official College Board Resources

The College Board?s released exams and scoring guidelines are the gold standard. These resources undergo rigorous validation processes, ensuring alignment with the curriculum and scoring standards. When students utilize official answer keys:

- They receive precise solutions aligned with exam expectations.
- They understand the scoring rubric, which clarifies what exam graders look for.
- They gain insight into common pitfalls and misconceptions.

Challenges with Unofficial Answer Keys

While unofficial answer keys can be valuable, their reliability varies:

- Accuracy: Not all sources double-check solutions thoroughly.
- Explanations: Some may lack detailed reasoning, which diminishes their instructional value.
- Bias or Errors: Human error can introduce inaccuracies, leading students astray.

To mitigate these issues, students should cross-reference unofficial answer keys with official materials or consult teachers for clarification.

Assessing the Quality of Unofficial Resources

When considering third-party answer keys:

- Verify the source?s credibility (e.g., reputable educational websites, published tutors).
- Check for consistency with official solutions.
- Seek reviews or feedback from other students or educators.
- Use answer keys as supplementary, not sole, resources.

Ethical Considerations Surrounding Answer Keys in AP Stats

While answer keys are legitimate study aids, their use must be framed within ethical boundaries to maintain academic integrity and promote genuine learning.

Proper Use of Answer Keys

- For Self-Study: Using answer keys to check understanding after attempting problems is acceptable.
- During Practice: Employing answer keys to verify solutions during practice sessions helps reinforce concepts.
- In Class: Teachers may incorporate answer keys into instruction, emphasizing problem-solving strategies.

Misuse and Academic Dishonesty

Problems arise when students:

- Share answer keys during assessments, risking violations of exam rules.
- Use answer keys to complete assessments without understanding.
- Rely solely on answer keys instead of engaging with the problem-solving process.

Such behaviors compromise fairness and diminish the value of the AP experience. It is essential for educators and students to foster a culture of integrity, emphasizing learning over merely obtaining correct answers.

Guidelines for Ethical Use

- Use answer keys as a learning tool, not a shortcut during exams.
- Do not share answer keys during tests or assessments.
- Cross-verify unofficial answer keys with official sources.
- Focus on understanding solutions rather than memorizing answers.

Best Practices for Incorporating Answer Keys AP Stats into Study Regimens

Maximizing the benefits of answer keys involves strategic and ethical integration into study routines.

Structured Practice Sessions

- Attempt problems without aids first.
- Use answer keys to check solutions afterward.
- Review incorrect answers to understand mistakes.
- Reattempt problems to reinforce learning.

Developing Critical Thinking

- Analyze the reasoning behind each solution.
- Understand why certain answer choices are incorrect.
- Explore alternative problem-solving methods.

Supplementing with Official Resources

- Prioritize official College Board released exams and scoring guidelines.
- Use unofficial answer keys cautiously and as supplementary aids.

Engaging with Educators and Peers

- Discuss challenging problems and solutions.
- Clarify uncertainties with teachers.
- Participate in study groups to enhance understanding.

The Future of Answer Keys in AP Stats Preparation: Technology and Ethical Trends

As digital resources become more prevalent, the landscape of answer keys continues to evolve.

Technological Innovations

- AI-Generated Solutions: Some platforms now use artificial intelligence to generate explanations, increasing accessibility but raising questions about accuracy.
- Interactive Platforms: Online workspaces allow students to input solutions and receive immediate feedback, often with step-by-step guides.

Ethical Challenges

- The proliferation of readily accessible answer keys may tempt students to bypass genuine learning.
- Educators must emphasize skill mastery over answer memorization.
- Institutions may implement measures like proctored assessments or alternative question formats to reduce reliance on answer keys.

Balancing Convenience and Integrity

- Resources should be designed to promote understanding rather than rote answer retrieval.
- Educators can incorporate open-ended questions that challenge students to explain reasoning, making answer keys less central.

Answer keys AP Stats serve as invaluable tools in the landscape of exam preparation, offering guidance, confidence, and a means for self-assessment. Their proper use can enhance understanding and foster mastery of statistical concepts. However, reliance on answer keys must be balanced with ethical considerations, critical thinking, and a focus on genuine comprehension. Both educators and students bear responsibility for fostering responsible use, ensuring that these resources augment learning rather than undermine it. As technology advances and resources become more accessible, maintaining integrity and prioritizing authentic understanding will remain central to successful AP Statistics preparation. Ultimately, answer keys should be viewed as

aids?not crutches?in the pursuit of statistical literacy and academic excellence.

QuestionAnswer Where can I find official AP Statistics answer keys for practice exams? Official AP Statistics answer keys are available on the College Board website under the AP Classroom and AP Central sections, typically released after practice exams or released by your teacher. How can I use answer keys to improve my AP Stats exam score? Using answer keys, you can review your mistakes, understand the correct methods, and identify patterns in errors, which helps target areas for improvement and refine your problem-solving skills. Are answer keys for AP Stats practice exams reliable for studying? Yes, official answer keys are reliable as they are created by the College Board, ensuring accuracy in grading and solutions, making them essential for effective practice. Can I find answer keys for all AP Statistics practice questions online? While official answer keys are available through the College Board, some third-party websites and study resources may also provide answer keys, but always verify their accuracy with official sources. How do answer keys help with understanding AP Statistics concepts? Answer keys often include detailed solutions that explain the reasoning behind each step, helping students grasp underlying concepts and improve problem-solving strategies. Are there any tips for using answer keys effectively during AP Stats preparation? Yes, try solving questions on your own first, then use the answer key to check your work, understand mistakes, and learn alternative solution methods for a deeper understanding. What should I do if my answer doesn't match the answer key in AP Stats practice exams? Review your solution process carefully to identify where you went wrong, compare it with the official solution, and practice similar problems to reinforce correct methods. Are answer keys useful for timed AP Statistics practice sessions? Absolutely, they help students quickly check their answers and understand solutions, which is crucial for managing time effectively during the actual exam.

Related keywords: AP Stats answer keys, AP Statistics solutions, AP Stats practice exams, AP Statistics review, AP Stats exam answers, AP Statistics study guide, AP Stats answer sheet, AP Statistics free responses, AP Stats scoring guide, AP Statistics test answers

The Clue Of The Black Keys

The Clue of the Black Keys: Unlocking the Secrets of Piano Keys and Their Significance

The phrase **the clue of the black keys** often sparks curiosity among music enthusiasts, students, and even casual listeners. At first glance, the black keys on a piano might seem like merely aesthetic elements or accidental design choices. However, these keys hold a wealth of musical, historical, and theoretical significance that can deepen our understanding of music theory, piano playing, and musical composition. In this comprehensive guide, we will explore the origins,

functions, and secrets behind the black keys, offering valuable insights for both beginners and seasoned musicians alike.

Understanding the Layout of the Piano Keyboard

The Standard Piano Keyboard Configuration

The modern piano keyboard consists of 88 keys, with a repeating pattern of white and black keys that span across octaves. The white keys represent the natural notes?A, B, C, D, E, F, and G?while the black keys are sharp () or flat (b) notes that provide the chromatic variety essential for musical expression.

- **White Keys:** Natural notes (A-G)
- **Black Keys:** Sharp or flat notes, arranged in groups of two and three across the keyboard

The Pattern of Black Keys

The black keys are arranged in a repeating pattern of two and three keys. This pattern is crucial for orientation and navigation on the keyboard. Each set of black keys is associated with specific notes that complement the white keys, enabling musicians to play in different keys and modes.

- Two black keys together, followed by three black keys, then back to two, creating a repeating cycle
- The black keys within each group serve as sharps and flats of the adjacent white keys

The Significance of the Black Keys in Music Theory

Identifying Notes and Scales

The black keys serve as reference points for understanding scales, chords, and harmonic structures. They allow musicians to navigate complex musical landscapes effortlessly.

- **Sharps and Flats:** The black keys are named based on their relationship to adjacent white keys, either as sharps () or flats (b). For example, the black key between C and D can be called C or D?.
- **Major and Minor Scales:** Most major and minor scales incorporate black keys to create different tonalities, such as G major (which contains an F) or A minor (which contains a C).
- **Chromatic and Pentatonic Scales:** Black keys expand the palette of notes available, enabling

more diverse scales and melodies.

Building Chords and Harmonies

Black keys are essential in constructing various chords, especially in jazz, blues, and contemporary music. They provide the necessary intervals to build major, minor, diminished, augmented, and complex chords.

- Major chords often include a root, major third, and perfect fifth, with black keys frequently forming the third or fifth
- Extended chords, such as seventh, ninth, and thirteenth chords, rely heavily on black keys for their distinctive sounds

The Historical Context of the Black Keys

Origin of the Black Keys' Arrangement

The design of the black keys dates back to the development of early keyboard instruments. The layout was influenced by the need to facilitate ease of playing and to accommodate the tuning systems used in different musical eras.

- In medieval and Renaissance instruments, keys were arranged to reflect the modes and scales of the time.
- The pattern of two and three black keys became standardized with the advent of the harpsichord and early pianos in the 17th and 18th centuries.

Evolution Through Musical Periods

Throughout history, the black keys have played a pivotal role in the development of musical styles:

- **Baroque Era:** Emphasis on ornamentation and complex counterpoint, utilizing black keys for accidentals.
- **Classical Period:** Clear structure and harmony, with black keys supporting modulations and key changes.
- **Romantic Era:** Expanded use of chromaticism, often involving black keys for expressive purposes.
- **Contemporary Music:** Fusion genres and jazz heavily rely on black keys for improvisation and unique tonal colors.

The Clue of the Black Keys in Musical Composition and Improvisation

Deciphering Melodies and Harmonies

The black keys can serve as clues or guideposts in improvisation and composing. Musicians often use the black keys to create tension, color, and emotional depth within their music.

- Jazz improvisers frequently exploit the black keys to craft bluesy, soulful lines.
- Composers utilize the black keys to introduce chromaticism and unexpected harmonic shifts.

Playing in Different Keys

Black keys are instrumental in facilitating modulation to different keys, especially those with sharps or flats in their key signature. Recognizing the clues provided by black keys helps musicians modulate smoothly and confidently.

The Clue of the Black Keys as a Learning Tool

For beginners, the pattern of black keys acts as a visual and tactile cue for learning scales, chords, and proper finger positioning. This natural pattern simplifies the process of mastering the keyboard.

Practical Tips for Musicians Regarding the Black Keys

Mastering the Black Keys

- Practice scales that include black keys, such as G major, D major, and B minor
- Identify and memorize the pattern of two and three black keys to navigate the keyboard confidently
- Use black keys as a reference point when playing melodies and harmonies

Incorporating Black Keys into Your Playing

- Experiment with melodies that primarily utilize black keys to develop a bluesy or exotic sound
- Practice chord voicings that include black keys to enrich your harmonic vocabulary
- Learn to improvise using the black keys as a basis for creating tension and resolution

Conclusion: Unlocking the Secrets of the Black Keys

The clue of the black keys extends far beyond their visual appearance on the piano. They serve as a gateway to understanding musical structure, history, and creative expression. By recognizing the patterns, functions, and significance of black keys, musicians can enhance their technical skills, expand their musical vocabulary, and deepen their appreciation for the intricate design of the piano. Whether you're a beginner learning the basics or an advanced player exploring complex compositions, embracing the secrets of the black keys can unlock new horizons in your musical journey.

Ultimately, the black keys are not just accidental dark spots on a white background?they are vital clues that reveal the richness and complexity of music. So next time you see those black keys, remember: they hold the key to unlocking a world of musical possibilities.

The Clue of the Black Keys: Decoding Their Significance in Music and Beyond

Music, as a universal language, relies heavily on the nuanced interplay of various elements?from rhythm and melody to harmony and instrumentation. Among these, the black keys on a piano or keyboard stand out as distinctive features, both visually and sonically. They serve not only as essential notes in musical compositions but also as symbolic and functional clues that guide musicians and listeners alike. Understanding the clue of the black keys unlocks deeper appreciation for musical structure, keyboard layout, and even cultural connotations embedded within keyboard instruments.

Understanding the Layout of the Black Keys

The black keys on a piano or keyboard are arranged in a repeating pattern that forms the basis of Western musical scales. These keys are positioned above the white keys and are grouped in sets of twos and threes, creating a visual and tactile map that helps musicians navigate the instrument.

The Pattern and Its Significance

- Pattern Repetition: The black keys are arranged in a sequence of two followed by three, repeating across the entire keyboard.
- Identification: This pattern serves as a navigational aid, allowing musicians to quickly locate notes and understand musical intervals.
- Visual Clues: The visual grouping helps beginners and experts alike to orient themselves on the keyboard without needing to look at each key individually.

Functionality in Musical Scales

- Black keys represent sharps () or flats (b), depending on context.
- They form essential parts of major and minor scales, as well as modes.
- The arrangement of black and white keys underpins the structure of tonal music, enabling complex harmonies.

Pros and Cons of the Keyboard Layout

Pros:

- Logical pattern simplifies learning for beginners.
- Visual cues aid quick orientation and improvisation.
- Facilitates the understanding of musical intervals and scales.

Cons:

- Can be confusing for newcomers unfamiliar with sharps/flats.
- Limited to the Western tuning system; other musical traditions may differ.

The Musical Clue: How Black Keys Guide Composition and Improvisation

The black keys serve as a crucial clue in both the composition process and live improvisation, acting as markers that influence melodic and harmonic choices.

Guiding Musical Composition

- Composers often use the black keys to evoke specific moods or tonalities.
- The pattern of black keys influences the choice of scales?such as pentatonic, blues, or chromatic?that are rooted in black key notes.
- Certain keys, like F major or C minor, predominantly utilize black keys, shaping the character of the piece.

Assisting Improvisation and Playing

- Skilled improvisers leverage the black keys to craft melodies that are expressive and distinctive.
- The black keys offer a natural pentatonic scale (black keys only) in certain keys like G or D, providing a rich palette for jazz, blues, and rock improvisation.

- The visual proximity of black keys allows for quick finger movements, especially in complex passages.

Features of Using Black Keys as Clues

- Enable musicians to identify scales and modes swiftly.
- Offer a harmonic foundation for blues and jazz genres.
- Aid in transposing melodies across different keys.

The Cultural and Symbolic Clues of Black Keys

Beyond their practical use, black keys carry cultural significance and symbolism in various contexts.

Symbolism in Music and Art

- The contrast between black and white keys has inspired artistic interpretations, symbolizing duality, balance, and harmony.
- Black keys often evoke moods associated with mystery, depth, or melancholy.

In Popular Culture

- The phrase "black keys" can also refer to certain motifs or themes in music and literature, representing hidden or cryptic clues.
- The Black Keys, a popular rock band, used the motif to emphasize raw, gritty sound and underground appeal.

Functional Clues in Instrument Design

- The black keys' arrangement influences the design of alternative keyboard layouts, such as the Janko or harmonic keyboards, which aim to optimize ergonomic play.
- Their pattern acts as a historical clue to the evolution of keyboard instruments over centuries.

Pros and Cons of Cultural Significance

Pros:

- Adds depth and meaning to musical interpretation.
- Inspires artistic creativity beyond just technical playing.

Cons:

- May lead to overinterpretation or symbolism that distracts from technical mastery.
- Cultural connotations can vary widely across regions and eras.

Technical Features and Innovations Related to Black Keys

Advancements in keyboard instrument design and technology often revolve around the black keys? layout and functionality.

Electronic and Digital Instruments

- Modern digital keyboards replicate the black and white key layout, often with adjustable sensitivity and color coding.
- Some virtual instruments highlight black keys for easier navigation or learning modes.

Ergonomic Innovations

- Alternative keyboard designs attempt to minimize stretch and finger movement by reconfiguring the black keys? placement.
- The ergonomic approach emphasizes the importance of the black keys as clues for efficient playing.

Features Summary

- Compatibility with traditional piano layouts ensures ease of learning.
- Innovations aim to enhance accessibility for learners and performers.
- The black keys remain central to instrument design, maintaining their role as functional clues.

Conclusion: The Enduring Clue of the Black Keys

The black keys on a keyboard are far more than mere accidentals or visual markers; they embody a complex system of clues that inform, inspire, and guide musicians across genres and generations. Their arrangement provides essential navigational cues, shapes the structure of scales and chords,

and carries cultural symbolism that enriches the musical experience. Whether used in classical compositions, jazz improvisations, or modern pop songs, black keys serve as a vital clue?a key?to understanding the intricate language of music.

By decoding the clue of the black keys, musicians can unlock deeper insights into harmony, improvisation, and musical expression. For learners, they offer a map to mastering the keyboard; for composers and performers, they serve as a foundation for creativity and innovation. As technology advances and musical styles evolve, the black keys will undoubtedly continue to serve as enduring clues?guiding lights in the vast landscape of musical exploration.

QuestionAnswer What is the significance of the black keys on a piano in identifying musical scales? The black keys on a piano serve as sharps and flats, helping players identify and construct different scales, such as the pentatonic or chromatic scales, and providing visual cues for navigation across the keyboard. How does the pattern of black keys help musicians find their way around the piano? The black keys are arranged in groups of two and three, creating a visual pattern that helps musicians quickly locate notes and intervals, making it easier to orient themselves on the keyboard, especially for beginners. What is the 'clue of the black keys' in understanding musical harmony? The black keys indicate the presence of accidentals like sharps and flats, which are essential in forming chords and understanding harmonic progressions within a piece of music. Why are the black keys often associated with the concept of musical mystery or complexity? Because the black keys introduce chromatic notes and accidentals, they add layers of complexity and color to music, often symbolizing mystery, tension, or emotional depth in compositions. How can the pattern of black keys aid in improvisation and composition? Knowing the arrangement of black keys helps musicians quickly identify scales, modes, and chord tones, facilitating improvisation and creative composition by providing a visual framework for exploring melodies and harmonies.

Related keywords: piano mystery, black keys, musical puzzle, detective story, keyboard clues, musical intrigue, black keys significance, musical detective, piano keys, musical code

Read the full article online: the clue of the black keys