Determinant of commercial bank profitability Full Version

determinant of commercial bank profitability is a multifaceted concept that encompasses various internal and external factors influencing a bank?s ability to generate profit. Understanding these determinants is crucial for bank managers, investors, regulators, and policymakers aiming to enhance financial stability and performance within the banking sector. Commercial banks operate in a competitive environment where their profitability depends on their capacity to manage risks, optimize costs, innovate products, and adapt to economic changes. This article delves into the key determinants that impact the profitability of commercial banks, providing insights into how these factors interplay to shape financial outcomes.

Internal Factors Affecting Commercial Bank Profitability

1. Bank-Specific Factors

Bank-specific factors refer to elements intrinsic to the bank?s operations, management, and strategic decisions. These include:

- **Management Efficiency:** The quality of management significantly influences profitability through effective decision-making, risk management, and operational efficiency. Well-managed banks tend to have lower costs and better asset quality.
- **Capital Adequacy:** Adequate capital buffers enable banks to absorb shocks and lend more confidently, thereby increasing profitability potential.
- **Asset Quality:** The level of non-performing loans (NPLs) directly impacts profitability. A higher NPL ratio leads to increased provisioning costs and reduced net income.
- **Cost Management:** Efficient control over operating expenses such as salaries, administrative costs, and technology investments enhances net earnings.
- **Productivity and Innovation:** Offering innovative financial products and improving service delivery can attract more customers and increase fee-based income.

2. Loan Portfolio Management

The composition and management of a bank?s loan portfolio are critical determinants. Key aspects include:

- **Loan Quality:** High-quality loans with minimal defaults contribute positively to profitability.
- **Interest Rate Spread:** The difference between interest earned on loans and interest paid on deposits forms the core of bank profitability.
- **Loan Diversification:** Diversifying across sectors and geographies reduces risk exposure and stabilizes earnings.

3. Cost Structure and Operational Efficiency

Operational efficiency is paramount for maximizing profits. Factors include:

- **Technological Adoption:** Investing in technology reduces transaction costs, speeds up processes, and improves customer experience.
- **Branch Network Optimization:** Balancing physical presence with digital channels helps control costs while reaching customers effectively.
- **Economies of Scale:** Larger banks often enjoy cost advantages, leading to higher profitability.

External Factors Influencing Commercial Bank Profitability

1. Economic Environment

The macroeconomic landscape heavily influences bank profitability through various channels:

- **Interest Rates:** Central bank policies affecting interest rates impact the net interest margin (NIM), a key profitability indicator.
- **Inflation:** Moderate inflation can boost nominal income, but hyperinflation may erode real profits.
- **Economic Growth:** Robust economic growth increases demand for loans and other financial services, boosting bank earnings.

2. Regulatory and Legal Framework

Regulations shape the operational environment of banks:

- **Capital Requirements:** Stricter capital adequacy standards may limit lending but enhance stability.
- **Supervisory Policies:** Effective supervision reduces risks and enhances confidence, indirectly supporting profitability.
- **Tax Policies:** Taxation levels influence net income and investment in profitability-enhancing

initiatives.

3. Competition and Market Structure

Market dynamics affect banks? pricing strategies and profitability margins:

- **Market Concentration:** Highly concentrated markets can lead to higher pricing power for dominant banks.
- **Entry Barriers:** High entry barriers limit competition, allowing existing banks to maintain better margins.
- **Product Differentiation:** Offering unique products can capture niche markets and improve profitability.

4. Technological Advancements and Digital Transformation

The rapid evolution of technology has transformed banking operations:

- **Digital Banking Services:** Online and mobile banking reduce costs and expand customer reach.
- **Fintech Collaborations:** Partnering with fintech firms can diversify revenue streams and improve efficiency.
- **Cybersecurity Risks:** Effective cybersecurity measures prevent losses and reputation damage, indirectly supporting profitability.

Quantitative Measures of Profitability

Assessing the determinants of profitability involves analyzing various financial ratios and indicators, including:

- **Net Interest Margin (NIM):** Measures the difference between interest income and interest expenses relative to earning assets.
- **Return on Assets (ROA):** Indicates how efficiently a bank uses its assets to generate profit.
- **Return on Equity (ROE):** Reflects profitability relative to shareholders? equity.
- **Cost-to-Income Ratio:** Shows operational efficiency by comparing operating expenses to net income.

Strategies to Enhance Bank Profitability

Understanding the determinants allows banks to adopt strategies that improve profitability:

- Strengthening risk management frameworks to reduce NPLs.
- Optimizing the loan portfolio through diversification and quality control.
- Investing in technology to lower operational costs and improve customer experience.
- Expanding fee-based services such as asset management, insurance, and advisory services.
- Adjusting interest rate strategies in response to market conditions to maximize spreads.
- Maintaining adequate capital buffers to support growth and absorb shocks.

Conclusion

The determinant of commercial bank profitability is a complex interplay of internal management practices, external economic and regulatory environments, technological advancements, and competitive dynamics. Banks that effectively manage their assets and liabilities, innovate in their service offerings, and adapt to macroeconomic and regulatory changes are better positioned to sustain and enhance profitability. Continuous analysis of these determinants, coupled with strategic planning and risk management, is essential for banks aiming to thrive in an increasingly competitive and rapidly evolving financial landscape.

By understanding and addressing these various factors, stakeholders can better gauge the health of banking institutions and implement policies that foster stability, growth, and long-term profitability.

Determinants of Commercial Bank Profitability

Commercial banks serve as pivotal players in the financial ecosystem, facilitating economic growth, mobilizing savings, and providing essential credit facilities. The profitability of these institutions is a vital indicator of their financial health and stability, influencing stakeholders? confidence and the broader economy's resilience. Understanding the determinants of commercial bank profitability is, therefore, crucial for regulators, investors, policymakers, and bank management alike. This comprehensive review explores the multifaceted factors influencing bank profitability, analyzing both internal and external determinants, and examining how they interplay to shape banks' financial performance.

Introduction to Bank Profitability

Bank profitability refers to the bank's ability to generate earnings relative to its assets, equity, or liabilities over a specific period. Common measures include Return on Assets (ROA), Return on Equity (ROE), net interest margin, and cost-to-income ratio. These metrics provide insights into how efficiently a bank is operating, its capacity to generate profit from its assets, and how effectively it manages costs and revenues.

The profitability of a bank is affected by a blend of internal factors?such as management quality, operational efficiency, and capital adequacy?and external factors like macroeconomic conditions, regulatory environment, and competitive landscape. Dissecting these determinants helps stakeholders to identify areas of strength and vulnerability, enabling better strategic decision-making.

Internal Determinants of Bank Profitability

Internal determinants are factors within the control of the bank or influenced directly by its management practices. These include operational efficiency, risk management, capital adequacy, and strategic orientation.

1. Management Quality and Strategic Decisions

Effective management is the cornerstone of bank profitability. Leadership's strategic choices regarding lending policies, product offerings, and technological investments determine the bank?s operational success. Skilled management ensures optimal asset quality, cost control, and innovative product development, all of which bolster profitability.

2. Asset Quality

Asset quality, primarily reflected through the level of non-performing loans (NPLs), directly impacts profitability. High NPLs increase provisioning costs and reduce net income. Banks with prudent credit risk assessment and monitoring tend to maintain healthier asset portfolios, leading to stable profits.

3. Capital Adequacy

Capital adequacy, measured by ratios like the Capital Adequacy Ratio (CAR), provides a buffer against potential losses. Adequate capital enhances confidence among depositors and investors, enabling banks to expand lending activities and generate higher income streams without undue risk, thereby positively influencing profitability.

4. Operational Efficiency

Operational efficiency pertains to how well a bank manages its operating costs relative to its income. The cost-to-income ratio is a common measure; lower ratios indicate higher efficiency. Banks that effectively leverage technology, streamline processes, and control operating expenses tend to be more profitable.

5. Product Mix and Revenue Diversification

Banks offering a diversified range of products?such as loans, deposits, investment banking, and fee-based services?are better positioned to generate multiple income streams. Revenue diversification reduces reliance on interest income alone, mitigating risks and enhancing profitability.

External Determinants of Bank Profitability

External factors are largely beyond the control of individual banks but significantly influence their profitability landscape. These include macroeconomic conditions, regulatory policies, competitive dynamics, and technological developments.

1. Macroeconomic Environment

Economic stability, growth rates, inflation levels, and interest rates are among the most influential external determinants.

- Interest Rates: Fluctuations influence net interest margins; higher rates can increase lending income but may also elevate default risk.
- Economic Growth: Robust growth promotes loan demand and reduces credit risk, leading to higher profits.
- Inflation: Moderate inflation may support asset growth, while hyperinflation can erode real returns.
- Unemployment Rates: High unemployment increases default risk, adversely affecting profitability.

2. Regulatory Framework and Supervision

Regulatory policies, including capital requirements, reserve ratios, and lending limits, shape bank operations.

- Stringent Regulations: While ensuring stability, overly restrictive policies may constrain lending and profitability.
- Liberal Policies: May foster higher profits but could expose banks to increased risks.
- Supervisory Oversight: Effective supervision ensures risk mitigation, promoting sustainable profitability.

3. Competitive Environment

Market competition influences pricing strategies, product innovation, and customer service quality.

- High Competition: Can compress net interest margins and fee income, reducing profitability.
- Market Concentration: Fewer players may allow banks to set higher prices and improve margins.

4. Technological Advancements

Technological progress influences operational efficiency, customer engagement, and service delivery.

- Digital Banking: Reduces operational costs and expands customer reach.
- Cybersecurity Risks: Increased digital activity necessitates investments in security, impacting costs.

Financial Structure and Its Impact on Profitability

The composition of a bank?s assets and liabilities significantly affects its profitability. Key aspects include leverage, liquidity management, and funding sources.

1. Leverage and Capital Structure

Higher leverage can amplify profits but also increases risk exposure. The optimal capital structure balances risk and return, influencing profitability metrics like ROE.

2. Asset-Liability Management

Effective matching of assets and liabilities minimizes interest rate risk and liquidity risk, stabilizing earnings.

3. Funding Sources

Reliance on stable, low-cost funding sources such as customer deposits enhances net interest margins. Overdependence on costly borrowing can reduce profitability.

Risk Management and Profitability

Risk management practices profoundly impact profitability by mitigating potential losses.

1. Credit Risk Management

Robust credit assessment and monitoring reduce NPLs and provisioning costs, supporting

consistent profits.

2. Market Risks

Interest rate, exchange rate, and equity price risks, if unmanaged, can cause volatile earnings.

3. Operational Risks

Efficient internal controls and technological safeguards minimize operational disruptions and associated costs.

Conclusion: The Interplay of Determinants and Future Outlook

The profitability of commercial banks hinges on a complex web of internal capabilities and external macroeconomic and regulatory conditions. While management practices and operational efficiencies are within the bank?s control, external factors such as economic cycles, regulatory regimes, and technological innovations exert significant influence.

In an era marked by rapid technological change and evolving regulatory landscapes, banks must adapt strategically to sustain profitability. Embracing digital transformation, strengthening risk management, and maintaining prudent capital buffers are essential strategies to navigate challenges and capitalize on opportunities.

Furthermore, as global economic uncertainties persist?ranging from geopolitical tensions to climate change impacts?banks? ability to anticipate and respond to external shocks will become increasingly vital. Sound governance, innovative product offerings, and resilient risk frameworks will be the pillars supporting long-term profitability.

Understanding these determinants provides valuable insights not only for bank executives aiming to enhance performance but also for regulators and investors seeking to assess the stability and growth prospects of financial institutions. Ultimately, a balanced approach that considers both internal strengths and external realities will determine a commercial bank?s success in delivering sustainable profitability in a dynamic financial environment.

QuestionAnswer What are the main determinants of commercial bank profitability? The main determinants include interest rate spread, asset quality, cost efficiency, capital adequacy, and macroeconomic factors such as economic growth and inflation. How does interest rate spread influence commercial bank profitability? Interest rate spread, the difference between interest earned on assets and paid on liabilities, directly impacts profitability; higher spreads typically lead to higher profits. What role does asset quality play in determining bank profitability? Asset quality, reflected by non-performing loans and loan provisions, affects profitability by influencing income stability and risk

management efficiency. How does operational efficiency impact the profitability of commercial banks? Operational efficiency, measured by cost-to-income ratio, determines how well a bank manages its expenses; higher efficiency results in higher net income and profitability. In what way does capital adequacy influence bank profitability? Adequate capital buffers enable banks to absorb losses and maintain confidence, which can enhance profitability by reducing costs related to risk and regulatory penalties. How do macroeconomic factors affect the determinants of bank profitability? Factors like economic growth, inflation, and interest rate policies impact loan demand, credit risk, and operational costs, thereby influencing profitability determinants. Why is asset-liability management crucial for commercial bank profitability? Effective asset-liability management ensures optimal interest rate matching and liquidity, reducing risks and improving net interest margins, thus boosting profitability.

Related keywords: bank profitability, commercial banking, financial performance, net interest margin, return on assets, return on equity, credit risk, loan portfolio, operational efficiency, regulatory impact

maths ncert solutions class 12 determinants

maths ncert solutions class 12 determinants are an essential resource for students preparing for their Board examinations and seeking a clear understanding of this fundamental mathematical concept. Determinants play a crucial role in various branches of mathematics, including linear algebra, calculus, and differential equations, and form the basis for solving systems of linear equations, finding matrix inverses, and understanding transformations. Access to comprehensive and well-structured NCERT solutions can significantly enhance students? grasp of determinants, improve problem-solving skills, and boost confidence in exam settings.

Understanding the Concept of Determinants

What are Determinants?

A determinant is a scalar value that can be computed from the elements of a square matrix. It provides critical information about the matrix, such as whether the matrix is invertible or singular. For a square matrix A, the determinant is denoted as $\det(A)$ or $|A|$.

Importance of Determinants in Mathematics

Determinants are vital in:

- Solving systems of linear equations using Cramer's rule
- Finding the inverse of a matrix
- Calculating the area and volume in coordinate geometry
- Understanding eigenvalues and eigenvectors
- Analyzing linear transformations

Class 12 NCERT Solutions for Determinants

Why Are NCERT Solutions Important?

NCERT solutions serve as an authoritative guide aligned with the CBSE curriculum. They simplify complex concepts, provide step-by-step problem-solving methods, and help students prepare effectively for exams. For determinants, these solutions clarify the process of calculating determinants of different order matrices, properties, and applications.

Key Features of NCERT Solutions for Class 12 Determinants

- Detailed explanations of concepts
- Step-by-step solutions to practice problems
- Illustrations and examples for better understanding
- Covering all types of determinants (2x2, 3x3, etc.)
- Focus on important properties and theorems

Topics Covered in Class 12 NCERT Solutions on Determinants

1. Determinant of a 2x2 Matrix

This fundamental concept involves calculating the determinant of a 2x2 matrix:

\[

A = \begin{bmatrix}

a & b \\

c & d

\end{bmatrix}

\]

The determinant is computed as:

\[

|A| = ad - bc

\]

Understanding this basic formula is crucial as it forms the foundation for larger matrices.

2. Determinant of a 3x3 Matrix

For a 3x3 matrix:

\[

A = \begin{bmatrix}

a_{11} & a_{12} & a_{13} \\

a_{21} & a_{22} & a_{23} \\

a_{31} & a_{32} & a_{33}

\end{bmatrix}

\]

The determinant can be expanded using minors and cofactors, often calculated via the rule of Sarrus or Laplace expansion.

3. Properties of Determinants

NCERT solutions elaborate on properties such as:

- Determinant of a transpose matrix equals the original determinant: \(\det(A^T) = \det(A)\)
- Determinant of a product: \(\det(AB) = \det(A) \det(B)\)
- Determinant of an inverse: \(\det(A^{-1}) = 1/\det(A)\)
- Effect of row operations on determinants

4. Calculation Techniques

Solutions include methods to compute determinants efficiently:

- Row and column operations
- Expansion by minors
- Using properties to simplify calculations

5. Adjoint and Inverse of a Matrix

Understanding how to find the adjoint matrix and the inverse using determinants is covered thoroughly, emphasizing the relation:

\[

A^{-1} = \frac{1}{\det(A)} \text{adj}(A)

\]

6. Applications of Determinants

Real-world applications and problem-solving scenarios are included:

- Checking the invertibility of a matrix
- Solving linear systems using Cramer?s rule
- Calculating areas and volumes

Sample Problems and Their Solutions

Example 1: Find the determinant of the matrix

\[

A = \begin{bmatrix}

1 & 2 \\

3 & 4

\end{bmatrix}

\]

Solution:

\[

|A| = (1)(4) - (2)(3) = 4 - 6 = -2

\]

Example 2: Find the inverse of the matrix if it exists

\[

A = \begin{bmatrix}

2 & 1 \\

5 & 3

\end{bmatrix}

\]

Solution:

First, calculate the determinant:

\[

|A| = (2)(3) - (1)(5) = 6 - 5 = 1

\]

Since \(\det(A) \neq 0\), the inverse exists:

\[

A^{-1} = \frac{1}{|A|} \begin{bmatrix}

3 & -1 \\

-5 & 2

\end{bmatrix} = \begin{bmatrix}

3 & -1 \\

-5 & 2

\end{bmatrix}

\]

How to Prepare Using NCERT Solutions for Determinants

Step-by-step Approach

- Start with understanding the basic concepts of determinants and their properties.
- Practice solving simple 2x2 and 3x3 determinant problems using NCERT solutions.
- Learn the step-by-step methods for calculating determinants, including minors and cofactors.
- Work through examples involving properties to simplify calculations.
- Apply the concepts to solve complex problems and previous years? question papers.

Tips for Effective Preparation

- Regularly revise the properties and formulas related to determinants.
- Practice a variety of problems to improve speed and accuracy.
- Understand the application of determinants in real-life problems and proofs.
- Use NCERT solutions as a reference to verify your answers and clarify doubts.
- Attend coaching classes or group study sessions for better conceptual clarity.

Conclusion

Mastering the concept of determinants through NCERT solutions for class 12 is vital for excelling in mathematics. These solutions not only clarify theoretical aspects but also enhance practical problem-solving skills. By systematically practicing the various types of determinant problems, students can build a strong mathematical foundation, which is essential for higher studies in engineering, computer science, and other technical fields. Remember, consistency and practice are

key to mastering determinants, and NCERT solutions serve as an invaluable resource in this journey toward mathematical excellence.

Maths NCERT Solutions Class 12 Determinants are an essential resource for students preparing for board exams and competitive tests alike. The chapter on determinants forms a crucial part of the Class 12 mathematics syllabus, laying the foundation for advanced topics such as matrices, system of linear equations, and vector algebra. Having access to comprehensive and well-structured NCERT solutions can significantly enhance understanding, improve problem-solving skills, and boost confidence among students. This article offers an in-depth review of the NCERT solutions for Class 12 determinants, highlighting their features, benefits, and some considerations for learners aiming to master this important chapter.

Understanding the Significance of NCERT Solutions for Class 12 Determinants

Determinants are algebraic expressions associated with square matrices that serve as a powerful tool in solving systems of linear equations, finding inverse matrices, and exploring properties of matrices. Mastery of determinants is vital because it not only simplifies complex calculations but also provides insights into matrix theory, eigenvalues, and eigenvectors.

NCERT solutions for determinants are tailored to align with the CBSE curriculum, ensuring students grasp concepts as per exam standards. They systematically cover the entire chapter, making complex topics more accessible through step-by-step explanations, illustrative examples, and practice problems.

Structure and Content of NCERT Solutions for Class 12 Determinants

Comprehensive Coverage of Concepts

The solutions meticulously address all core concepts, including:

- Definition and properties of determinants
- Minor, cofactor, and adjoint of a matrix
- Determinant of a 2x2 and 3x3 matrix
- Expansion of determinants along a row or column
- Properties and applications of determinants
- Inverse of a matrix using determinants
- Cramer's rule for solving linear equations

Step-by-Step Problem Solving

Each solution is crafted to guide students through:

- Understanding the problem
- Applying relevant formulas and properties
- Performing calculations with clarity and precision
- Drawing logical conclusions

This approach ensures learners develop a thorough understanding and can independently solve similar problems in exams.

Illustrative Examples and Practice Problems

The solutions include:

- Worked-out examples demonstrating application of concepts
- Additional practice questions with detailed solutions
- Tips and shortcuts to simplify calculations

Features and Benefits of NCERT Solutions for Class 12 Determinants

Features:

- Aligned with CBSE Syllabus: Ensures relevance and exam readiness.
- Clear and Concise Explanations: Simplifies complex topics for better comprehension.
- Detailed Step-by-Step Solutions: Enhances understanding of each stage involved in problem-solving.
- Illustrative Diagrams and Tables: Visual aids to clarify concepts.
- Variety of Problems: From basic to advanced, catering to diverse learning needs.
- Revision Notes and Important Points: Summaries for quick revision before exams.

Benefits:

- Boosts Conceptual Clarity: Helps students understand the 'why' and 'how' behind each step.
- Enhances Problem-Solving Skills: Practice with varied questions builds confidence.
- Prepares for Exams Effectively: Focused content aligned with exam pattern.
- Self-Assessment: Enables students to evaluate their understanding through practice problems.
- Time-Saving: Ready-to-use solutions reduce the time spent on doubts and calculations.

Advantages of Using NCERT Solutions for Class 12 Determinants

- Structured Learning: The solutions follow a logical sequence, facilitating systematic learning.
- Standardized Content: Ensures uniformity in understanding core concepts.
- Ease of Revision: Summaries and key points aid quick revision before exams.
- Foundation for Advanced Topics: Solid understanding of determinants benefits subsequent chapters like matrices and vectors.
- Self-Study Friendly: Enables students to learn independently without constant supervision.

Potential Limitations and Considerations

While NCERT solutions are immensely helpful, some points to consider include:

- Dependence on Solutions: Excessive reliance might hinder the development of problem-solving skills if not complemented with practice.
- Lack of Conceptual Depth in Some Areas: Some solutions focus more on procedures than on underlying theories.
- Limited to NCERT Syllabus: May not cover advanced problems or application-based questions beyond the curriculum.
- Need for Supplementary Resources: For in-depth understanding, additional reference books and online resources can be beneficial.

How to Maximize the Benefits of NCERT Solutions for Determinants

To get the most out of these solutions, students should:

- Use Them as a Learning Tool, Not Just for Answers: Try solving problems independently before consulting the solutions.
- Practice Regularly: Consistent practice helps reinforce concepts and improve accuracy.
- Understand the Concepts Thoroughly: Focus on understanding the properties and reasoning behind formulas.
- Seek Clarification: Discuss doubts with teachers or peers if certain solutions are unclear.
- Combine with Other Study Material: Use NCERT solutions alongside class notes, reference books, and online tutorials.

Conclusion

Maths NCERT Solutions Class 12 Determinants are an invaluable resource for students aiming to

excel in their board exams and build a strong foundation in linear algebra. Their structured approach, clarity, and comprehensive coverage make complex topics approachable and manageable. When used effectively, these solutions not only aid in mastering determinants but also foster analytical thinking, problem-solving skills, and confidence. As part of a well-rounded study plan, they serve as an excellent tool to achieve academic success and develop a deeper appreciation for mathematics.

In summary, leveraging NCERT solutions for determinants can transform challenging chapters into manageable and even enjoyable learning experiences. With consistent practice and active engagement, students can develop mastery over determinants, paving the way for success in higher studies and competitive exams.

QuestionAnswer What are the key concepts covered in NCERT Solutions for Class 12 Determinants? The NCERT Solutions for Class 12 Determinants primarily cover topics such as the definition of determinants, properties of determinants, minors and cofactors, calculation of determinants of different order matrices, and the application of determinants in solving systems of linear equations. How do NCERT solutions help in understanding the concept of the determinant of a 3x3 matrix? NCERT solutions provide step-by-step methods to compute the determinant of a 3x3 matrix using the rule of Sarrus and cofactor expansion, along with detailed explanations and examples, making it easier for students to grasp and apply the concept. Why is it important to practice determinants problems from NCERT solutions for Class 12 exams? Practicing problems from NCERT solutions helps students understand the fundamental concepts, improve problem-solving speed, and gain confidence in applying determinants to solve complex questions efficiently in exams. Can NCERT solutions help in solving systems of linear equations using determinants? Yes, NCERT solutions show how to use determinants, particularly Cramer's rule, to solve systems of linear equations, providing clear procedures and examples to understand when and how to apply this method. Are there any common mistakes to avoid while studying determinants with NCERT solutions? Common mistakes include miscalculating minors and cofactors, forgetting to consider the sign during cofactor expansion, and confusing properties of determinants. NCERT solutions emphasize careful calculation and understanding properties to avoid these errors.

Related keywords: class 12 determinants solutions, NCERT determinants chapter, mathematics class 12 determinants, determinants problem solutions, class 12 NCERT math solutions, determinants exercises class 12, NCERT class 12 math chapter determinants, determinants formulas class 12, solutions for determinants class 12, NCERT determinants practice questions

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