

TECNIA INTERNATIONAL SCHOOL
(AN ENGLISH MEDIUM SR. SEC. SCHOOL AFFILIATED TO CBSE)
F-19, SEC-8, ROHINI, NEW DELHI-85

HOLIDAY HOMEWORK

2018-19

Class-XII B

ENGLISH

I. Attempt all questions.

Q1. You want to sell your house at 15 Rajendra Nagar, New Delhi. Draft an advertisement in not more than 50 words, giving the necessary details, to be published in the classified columns of 'The New India Express.' You are Krishna/Alka.

Q2. You are Anuj, a social activist. Design a poster to observe 'Wildlife Protection Week' in your city, in 50 words.

Q3. G.L. Institute recently organised a 'No Tobacco' Workshop. Write a report on the same to be published in the newspaper in 150-200 words.

Q4. Spurt of violence previously unknown in Indian schools makes it incumbent on the educationists to introduce value education effectively in schools. Write an article in 150-200 words expressing your views on the need of value education. You are Anu/Aditya.

Q5. 'Brain Drain is not a bane for a country like India.' Write a debate in 150-200 words either for or against the motion.

BUSINESS STUDIES

I. Project One: Elements of Business Environment

The teachers should help the students in selecting any one element of the following:

1. Changes witnessed over the last few years on mode of packaging and its economic impact. The teacher may guide the students to identify the following changes:
 - a) The changes in transportation of fruits and vegetables such as cardboard
 - b) crates being used in place of wooden crates, etc. Reasons for above changes.
 - c) Milk being supplied in glass bottles, later in plastic bags and now in tetra-pack and through vending machines.
 - d) Plastic furniture [doors and stools] gaining preference over wooden furniture.
 - e) The origin of cardboard and the various stages of changes and growth.
 - f) Brown paper bags packing to recycled paper bags to plastic bags and cloth bags.
 - g) Re use of packaging [bottles, jars and tins] to attract customers for their products.
 - h) The concept of pyramid packaging for milk.
 - i) Cost being borne by the consumer/manufacturer.
 - j) Packaging used as means of advertisements.

2. The reasons behind changes in the following:
Coca – Cola and Fanta in the seventies to Thums up and Campa Cola in the eighties to Pepsi and Coke in nineties.

The teacher may guide the students to the times when India sold Coca Cola and Fanta which were being manufactured in India by the foreign companies.

The students may be asked to enquire about

- a) Reasons of stopping the manufacturing of the above mentioned drinks in India THEN.
 - b) The introduction of Thums up and Campa cola range.
 - c) Re entry of Coke and introduction of Pepsi in the Indian market.
 - d) Factors responsible for the change.
 - e) Other linkages with the above.
 - f) Leading brands and the company having the highest market share.
 - g) Different local brands venturing in the Indian market.
 - h) The rating of the above brands in the market.
 - i) The survival and reasons of failure in competition with the international brands.
 - j) Other observations made by the students
3. Changing role of the women in the past 25 years relating to joint families, nuclear families, women as a bread earner of the family, changes in the requirement trend of mixers, washing machines, micro wave and standard of living.
4. The changes in the pattern of import and export of different Products.
5. The trend in the changing interest rates and their effect on savings.
6. A study on child labour laws, its implementation and consequences.
7. The state of 'anti plastic campaign,' the law, its effects and implementation.
8. The laws of mining /setting up of industries, rules and regulations, licences required for running that business.
9. Social factors affecting acceptance and rejection of an identified product.
(Dish washer, Atta maker, etc)
10. What has the effect of change in environment on the types of goods and services? The students can take examples like:
- a) Washing machines, micro waves, mixers and grinder.
 - b) Need for crèche, day care centre for young and old.
 - c) Ready to eat food, eating food outside, and tiffin centres.
11. Change in the man-machine ratio with technological advances resulting in change of cost structure.
12. Effect of changes in technological environment on the behaviour of employee.

II. **Project Two: Principles of Management**

The students are required to visit any one of the following:

1. A departmental store.
2. An Industrial unit.
3. A fast food outlet.
4. Any other organisation approved by the teacher.

They are required to observe the application of the general Principles of management advocated by Fayol.

Fayol's principles

1. Division of work.
2. Unity of command.
3. Unity of direction.
4. Scalar chain
5. Esprit de corps
6. Fair remuneration to all.
7. Order.

8. Equity.
9. Discipline
10. Subordination of individual interest to general interest.
11. Initiative.
12. Centralisation and decentralisation.
13. Stability of tenure.

OR

They may enquire into the application of scientific management techniques by F.W. Taylor in the unit visited.

Scientific techniques of management.

1. Functional foremanship.
2. Standardisation and simplification of work.
3. Method study.
4. Motion Study.
5. Time Study.
6. Fatigue Study
7. Differential piece rate plan.

III. **Project Three: Stock Exchange**

The purpose of this project is to teach school students the values of investing and utilising the stock market. This project also teaches important lessons about the economy, mathematics and financial responsibility.

The basis of this project is to learn about the stock market while investing a specified amount of fake money in certain stocks. Students then study the results and buy and sell as they see fit.

This project will also guide the students and provide them with the supplies necessary to successfully monitor stock market trends and will teach students how to calculate profit and loss on stock.

The project work will enable the students to:

understand the topics like sources of business finance and capital market

understand the concepts used in stock exchange

inculcate the habit of watching business channels, reading business journals/newspapers and seeking information from their elders.

The students are expected to:

- a) Develop a brief report on History of Stock Exchanges in India. (your country)
- b) Prepare a list of at least 25 companies listed on a Stock Exchange.
- c) To make an imaginary portfolio totalling a sum of Rs. 50,000 equally in any of the 5 companies of their choice listed above over a period of twenty working days.

The students may be required to report the prices of the stocks on daily basis and present it diagrammatically on the graph paper.

They will understand the weekly holidays and the holidays under the Negotiable Instruments Act.

They will also come across with terms like closing prices, opening prices, etc.

During this period of recording students are supposed to distinctively record the daily and starting and closing prices of the week other days under the negotiable instrument act so that they acquire knowledge about closing and opening prices.

- The students may conclude by identifying the causes in the fluctuations of prices. Normally it would be related to the front page news of the a business journal, for example,
 - Change of seasons.
 - Festivals.
 - Spread of epidemic.
 - Strikes and accidents
 - Natural and human disasters. Political environment.
 - Lack of faith in the government policies.
 - Impact of changes in government policies for specific industry.
 - International events.
 - Contract and treaties at the international scene. Relations with the neighbouring countries.
 - Crisis in developed countries, etc.

The students are expected to find the value of their investments and accordingly rearrange their portfolio. The project work should cover the following aspects;

1. Graphical presentation of the share prices of different companies on different dates.
2. Change in market value of shares due to change of seasons, festivals, natural and human disasters.
3. Change in market value of shares due to change in political environment/ policies of various countries/crisis in developed countries or any other reasons
4. Identify the top ten companies out of the 25 selected on the basis of their market value of shares. It does not matter if they have made profits or losses.

IV. **Project Four:**
Marketing

1. Adhesives
2. Air conditioners
3. Baby diapers
4. Bathing Soap
5. Bathroom cleaner
6. Bike
7. Blanket
8. Body Spray
9. Bread
10. Breakfast cereal
11. Butter
12. Camera
13. Car
14. Cheese spreads
15. Chocolate
16. Coffee
17. Cosmetology product
18. Crayons
19. Crockery
20. Cutlery
21. Cycle
22. DTH
23. Eraser
24. e-wash
25. Fairness cream
26. Fans
27. Fruit candy
28. Furniture
29. Hair Dye
30. Hair Oil
31. Infant dress
32. Inverter
33. Jams
34. Jeans
35. Jewellery
36. Kurti
37. Ladies bag
38. Ladies footwear
39. Learning Toys
40. Lipstick
41. Microwave oven
42. Mixers
43. Mobile
44. Moisturizer
45. Music player
46. Nail polish
47. Newspaper
48. Noodles
49. Pen
50. Pen drive
51. Pencil
52. Pickles
53. Razor
54. Ready Soups
55. Refrigerator
56. RO system
57. Roasted snacks
58. Salt
59. Sarees
60. Sauces/ Ketchup
61. Shampoo
62. Shaving cream
63. Shoe polish
64. Shoes
65. Squashes
66. Suitcase/ airbag
67. Sunglasses
68. Tea
69. Tiffin Wallah
70. Toothpaste
71. Wallet
72. Washing detergent
73. Washing machine
74. Washing powder
75. Water bottle
76. Water storage tank
77. Wipes

Now the students are required to make a project on the identified product/service keeping in mind the following:

1. Why have they selected this product/service?
2. Find out '5' competitive brands that exist in the market.
3. What permission and licences would be required to make the product?
4. What are your competitors Unique Selling Proposition.[U.S.P.]?
5. Does your product have any range give details?
6. What is the name of your product?
7. Enlist its features.
8. Draw the 'Label' of your product.
9. Draw a logo for your product.
10. Draft a tag line.
11. What is the selling price of your competitor's product?
 - (i) Selling price to consumer
 - (ii) Selling price to retailer
 - (iii) Selling price to wholesaler

What is the profit margin in percentage to

- Manufacturer
- Wholesaler
- Retailer

12. How will your product be packaged?
13. Which channel of distribution are you going to use? Give reasons for selection?
14. Decisions related to warehousing, state reasons.
15. What is going to be your selling price?
 - (i) To consumer
 - (ii) To retailer
 - (iii) To wholesaler

16. List 5 ways of promoting your product.

17. Any schemes for
 - (i) The wholesaler
 - (ii) The retailer
 - (iii) The consumer

18. What is going to be your 'U.S.P'?

19. What means of transport you will use and why?

20. Draft a social message for your label.

21. What cost effective techniques will you follow for your product.

22. What cost effective techniques will you follow for your promotion plan. At this stage the students will realise the importance of the concept of marketing mix and the necessary decision regarding the four P's of marketing.

- Product
- Place
- Price
- Promotion

On the basis of the work done by the students the project report should include the following:

1. Type of product /service identified and the (consumer/industries) process involve there in.
2. Brand name and the product.
3. Range of the product.
4. Identification mark or logo.
5. Tagline.
6. Labeling and packaging.
7. Price of the product and basis of price fixation.
8. Selected channels of distribution and reasons thereof.
9. Decisions related to transportation and warehousing. State reasons.
10. Promotional techniques used and starting reasons for deciding the particular technique.
11. Grading and standardization.

Presentation and Submission of Project Report

At the end of the stipulated term, each student will prepare and submit his/her project report.

Following essentials are required to be fulfilled for its preparation and submission.

1. The total length of the project will be of 25 to 30 pages.
2. The project should be handwritten.
3. The project should be presented in a neat folder.
4. The project report should be developed in the following sequence-
 - Cover page should include the title of the Project, student information, school and year.
 - List of contents.
 - Acknowledgements and preface (acknowledging the institution, the places visited and the persons who have helped).
 - Introduction.
 - Topic with suitable heading.
 - Planning and activities done during the project, if any.
 - Observations and findings of the visit.
 - Conclusions (summarized suggestions or findings, future scope of study).
 - Photographs (if any).
 - Appendix
 - Teacher's observation.
 - Signatures of the teachers.
 - At the completion of the evaluation of the project, it should be punched in the centre so that the report may not be reused but is available for reference only.
 - The project will be returned after evaluation. The school may keep the best projects.

ECONOMICS

PROJECT WORK

- Students are supposed to pick any **ONE** of the two suggested projects.
- The project should be of 30-40 pages (approx), preferably hand-written.
- Teachers should help the students to select the topic after detailed discussions and deliberations. Teacher should play the role of a facilitator and should supervise and monitor the project work of the student. The teacher must periodically discuss and review the progress of the project.
- The teacher must play a vital role of a guide in the research work for the relevant data, material and information regarding the project work. Also, the students must be guided to quote the source (in the Bibliography/References section) of the information to ensure authenticity.
- The teacher must ensure that the students actually learn the concepts related to the project as he/she would be required to face questions related to the project in viva-voce stage of the final presentation of the project. Empirical study based / investing project work may be appreciated.
- The teacher may arrange a presentation in the classroom of each and every student so that students may learn from each others' project work.
- The teacher must ensure that the students learn various aspects of the concept related to the topic of the project work.

I. Project (Option One) : What's Going Around Us

The purpose of this project is to –

- Enable the student to understand the scope and repercussions of various Economic events and happenings taking place around the country and the world. (eg. The Dynamics of the Goods & Services Tax and likely impacts on the Indian Economy or the Economics behind the Demonetisation of 500 and 1000 Rupee Notes and the Short Run and Long Run impact on the Indian Economy or The impact of BREXIT from the European Union etc.)
- Provide an opportunity to the learner to develop economic reasoning and acquire analytical skills to observe and understand the economic events.
- Make students aware about the different economic developments taking place in the country and across the world.
- Develop the understanding that there can be more than one view on any economic issue and to develop the skill to argue logically with reasoning.
- Compare the efficacy of economic policies and their respective implementations in real world situations and analyse the impact of Economic Policies on the lives of common people.
- Provide an opportunity to the learner to explore various economic issues both from his/her day to day life and also issues which are of broader perspective.

Scope of the project: Student may work upon the following lines:

- Introduction
- Details of the topic
- Pros and Cons of the economic event/happening

- Major criticism related to the topic (if any)
- Students' own views/perception/ opinion and learning from the work
- Any other valid idea as per the perceived notion of the student who is actually working and presenting the Project-Work.

Suggestive List

1. Micro and small scale industries
2. Food supply channel in India
3. Contemporary employment situation in India
4. Disinvestment policy
5. Health expenditure (of any state)
6. Goods and Services Tax Act
7. Inclusive growth strategy
8. Human Development Index
9. Self help groups
10. Any other topic

II. **Project (Option Two): Analyse any concept from the syllabus**

The purpose of this project is to –

- Develop interest of the students in the concepts of Economic theory and application of the concept to the real life situations.
- Provide opportunity to the learners to develop economic reasoning *vis-a-vis* to the given concept from the syllabus.
- Enable the students to understand abstract ideas, exercise the power of thinking and to develop his/her own perception
- To develop the understanding that there can be more than one view on any economic issue and to develop the skill to argue logically with reasoning
- Compare the efficacy of economic policies in real world situations
- To expose the student to the rigour of the discipline of economics in a systematic way
- Impact of Economic Theory/ Principles and concepts on the lives of common people

Scope of the project:

Following essentials are required to be fulfilled in the project.

Explanation of the concept:

- Meaning and Definition
- Application of the concept
- Diagrammatic Explanation (if any)
- Numerical Explanation related to the concept etc. (if any)
- Students' own views/perception/ opinion and learning from the topic..

Mode of presentation and submission of the Project:

Suggested List:

- Price Determination
- Price Discrimination

- Opportunity Cost
- Production Possibility Curve
- Demand and its determinants
- Supply and its determinants
- Production – Returns to a Factor
- Cost function and Cost Curves
- Monopoly
- Oligopoly
- Monopolistic Competition
- Credit Creation
- Money Multiplier
- Central Bank and its functions
- Government Budget & its Components
- Budget deficit
- Exchange Rate Systems
- Foreign Exchange Markets
- Balance of payments
- Any other topic

ACCOUNTANCY

Project Work

20 Marks

Note: Kindly refer to the Guidelines published by the CBSE.

(REFER VOLUME-III BOOK)

PAINING

Prepare 20 Sheets of painting (Landscape and Human Full Figure)

INFORMATICS PRACTICES

Q1. (a) Which protocol is used to transfer hyper text documents on the internet?

(b) Which transmission medium should be used to transfer data across two continents at very high speed?

(c) Two neighbourhood schools, at a distance of 120 metres from each other, decide to join their LANs using UTP cable so that they can share their e-learning resources. But after joining their LANs, they are not able to share the resources due to loss of signal in-between. Which device should they use to establish proper connectivity?

(d) Which of the following softwares are Open Source:

Linux, MS Windows 7, Photoshop, MySql

(e) Distinguish between Open Source software and Proprietary software with reference to customizability of the software.

(f) Name any four Indian scripts included in Unicode.

(g) Sabhyata says that the following numbers indicate an address:

208.77.188.166

What is the above address called? To which object/device is it assigned?

(h) Tarun Nathani wants to upload and download files from/to a remote internet server. Write the name of the relevant communication protocol which will let her do the same.

(i) Two doctors in the same room have connected their Palmtops using Bluetooth for working on a group presentation. Out of the following, what kind of Network they have formed?

LAN, MAN, PAN, WAN

(j) Arrange the following communication channels in ascending order of their data transmission rates.

Ethernet Cable, Optical Fiber, Telephone Cable, Co -axial Cable

(k) Which of the following is not a characteristic of Open Source Software?

- Its source code is available for modification
- It is owned by a company or an individual
- It can be downloaded from internet

(l) Jatin Khanna is confused between the terms Domain Name and URL. Explain the difference with the help of appropriate examples of each.

Q2. Define any two threats to Network Security.

Q3. Differentiate between Star and Bus Topologies of networks

PHYSICAL EDUCATION

Complete The Record File

Record File shall include:

Practical-1:

Modified AAHPER administration for all items.

Practical-2:

Conduct Barrow 3 Item Test on 10 students.

Practical-3:

Procedure for Asanas, Benefits & Contraindication for any two Asanas each lifestyle disease.

Practical-4:

Procedure for administering Senior Citizen Fitness Test for 5 elderly family members.

Practical-5:

Any one game of your choice out of the list above. Labelled diagram of field & equipment Rules, Terminologies & Skills.

MATHEMATICS

Relations & Functions

- Q.1. Show that the relation R in the set $A = \{1,2,3,4,5\}$ given by $R = \{(a,b) : |a-b| \text{ is even}\}$, is an equivalence relation.
- Q.2. Show that the relation R in R defined by $R = \{(a,b) : a \leq b\}$, is reflexive and transitive but not symmetric.
- Q.3. Let $A = \mathbb{R} - \{3\}$ and $B = \mathbb{R} - \{1\}$, Consider the function $f: A \rightarrow B$ defined by $f(x) = \frac{x-2}{x-3}$. Show that f is one-one and onto
- Q.4. If $f: \mathbb{R} \rightarrow \mathbb{R}$ be given by $f(x) = (3-x^3)^{\frac{1}{3}}$, find the value of $f \circ f(x)$
- Q.5. Consider $f: \mathbb{R} \rightarrow \mathbb{R}$ given by $f(x) = 4x+3$, show that f is invertible. Find the inverse of f.
- Q.6. Show that binary operation $a * b = \frac{a+b}{2} \quad \forall a,b \in \mathbb{N}$ is commutative but not associative.
- Q.7. Show that $f: \mathbb{N} \rightarrow \mathbb{N}$ defined by $f(x) = \begin{cases} \frac{n+1}{2}, & \text{if n is odd} \\ \frac{n}{2}, & \text{if n is even} \end{cases}$ is many-one onto function.
- Q.8. Show that $f: \mathbb{R} - \{0\} \rightarrow \mathbb{R} - \{0\}$ given by $f(x) = 3/x$ is invertible and it is inverse of itself.
-

Q.9. On the set $M = A(x) = \left\{ \begin{bmatrix} x & x \\ x & x \end{bmatrix} : x \in \mathbb{R} \right\}$ of 2×2 matrices, find the identity element for the multiplication of matrices as a binary operation. Also, find the inverse of an element of M .

Q.10. Let $f(x) = [x]$ and $g(x) = |x|$ find $g \circ f(-5/3) - f \circ g(-5/3)$

Q.11. Show that the function $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = 3x^3 + 5$ for $x \in \mathbb{R}$ is a bijection.

Q.12. Show that the relation R on the set \mathbb{R} of all real numbers, defined as $R = \{ (a, b) : a \leq b^2 \}$ is neither reflexive nor symmetric nor transitive.

Matrices

Q.1. Construct a 3×4 matrix, whose elements are given by $a_{ij} = \frac{1}{2}|-3i + j|$

Q.2. If $A = \begin{bmatrix} 8 & 0 \\ 4 & -2 \\ 3 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -2 \\ 4 & 2 \\ -5 & 1 \end{bmatrix}$, then find the matrix X , such that $2A + 3X = 5B$.

Q.3. If $A = \begin{bmatrix} 0 & -\tan \alpha/2 \\ \tan \alpha/2 & 0 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then show that $I+A = (I-A) \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$

Q.4. Express the matrix $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ as the sum of symmetric & skew-symmetric matrix.

Q.5. Obtain the inverse of the matrix $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$ using elementary transformations.

Q.6. If $f(x) = \begin{bmatrix} \cos x & -\sin x & 0 \\ \sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix}$ Prove that $f(x) \cdot f(y) = f(x+y)$

Q.7. If A and B are invertible matrices of the same order, then prove that $(AB)^{-1} = B^{-1}A^{-1}$

Q.8. Let $f(x) = x^2 - 5x + 6$. Find $f(A)$ If $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$

Q.9. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ Show that $A^2 - 5A + 7I = 0$, Use this to find A^4 .

Q.10. Find the values of x, y, z if the matrix $A = \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$ satisfy the equation $A'A = I_3$.

Q.11. Prove that the product of matrices

$$\begin{bmatrix} \cos^2 \theta & \cos \theta \sin \theta \\ \cos \theta \sin \theta & \sin^2 \theta \end{bmatrix} \text{ and } \begin{bmatrix} \cos^2 \phi & \cos \phi \sin \phi \\ \cos \phi \sin \phi & \sin^2 \phi \end{bmatrix}$$

is the null matrix, when θ and ϕ differ by an odd multiple of $\frac{\pi}{2}$.

Q.12. Show that the following system of equations is consistent $2x - y + 3z = 5$, $3x + 2y - z = 7$, $4x + 5y - 5z = 9$, Also, find the solution.

Determinants

Q.1. Prove that : $\begin{vmatrix} 1 & x & x^2 \\ x^2 & 1 & x \\ x & x^2 & 1 \end{vmatrix} = (1 - x^3)^2$

Q.2. Find the equation of the line joining $A(1,3)$ and $B(0,0)$ using determinants and find if $D(K, 0)$ is a point such that area of a triangle ABD is 3 square units.

Q.3. If $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ Verify that $A^3 - 6A^2 + 9A - 4I = 0$ and hence find A^{-1}

Q.4. Prove that : $\begin{vmatrix} a+bx & c+dx & p+qx \\ ax+b & cx+d & px+q \\ u & v & \omega \end{vmatrix} = (1-x^2) \begin{vmatrix} a & c & p \\ b & d & q \\ u & v & \omega \end{vmatrix}$

Q.5. Solve by Matrix method:

$$\begin{aligned} 2x + y + z &= 1 \\ x - 2y - z &= 3/2 \\ 3y - 5z &= 9 \end{aligned}$$

Q.6. Prove that :

$$\begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+3c \end{vmatrix} = a^3$$

Q.7. Prove that : $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = abc + bc + ca + ab$.

Q.8. Solve : $\begin{vmatrix} x-2 & 2x-3 & 3x-4 \\ x-4 & 2x-9 & 3x-16 \\ x-8 & 2x-27 & 3x-64 \end{vmatrix} = 0$

Q.9. Using determinants, find the area of the triangle whose vertices are (1, 4), (2, 3), (-5, 3). Are the given points collinear?

Q.10. If the points (a_1, b_1) , (a_2, b_2) and $(a_1 + a_2, b_1 + b_2)$ are collinear, Show that $a_1b_2 = a_2b_1$.