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FBISE Mathematics Class 10
Topical workbook - Volume 1 of 2

140 questions arranged by official framework topic.
National Curriculum 2022-23; supported examinations from 2027.

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Complex Numbers

Domain A: Numbers and Algebra

FBISE model paper | Section A Q1(i) | 1 mark

i.	If $3-3i=(m-2)i+3$, then the value of m is:	-1	1	-5	5

FBISE model paper | Section B Q2(i) | 4 marks

i.	Express $\frac{(2+3i)}{(3-2i)^2}$ in the form $a+bi$	4

OR	Find the solution of following simultaneous linear equations with complex coefficients: $3ix+2iy=1,\ \ (2+i)x-(3-i)y=-1.$	8

(i)	Express the complex number (3 + 4i) ÷ (5 − 2i) in the form $a + bi$.	04

First Annual 2026 | Section C Q3 OR | 8 marks

Solve the following system of equations:

$$(2+i)x+(1-i)y=3$$
$$(1+i)x-iy=2$$

درج مساواتوں کو حل کریں۔ **08**

First Annual 2026 | Section A Q1 | 1 mark

1. The product $(1 + i)(1 - i)$ gives:
$(1 + i)(1 - i)$ کا حاصل ضرب کیا ہوگا؟

0	2	1 − i	1 + i
◯	◯	◯	

(i)	Simplify: $\frac{(1+i)}{(2+i)(3-i)}$ and express the answer in the form $a+bi$	04

A rectangular painting has length 5cm more than its width. A wooden frame of uniform width 3cm is fixed around it. If total area of the framed picture is $234cm^2$, find the dimensions of the painting. ایک مستطیلی تصویر کی لمبائی اس کی چوڑائی سے 5cm زیادہ ہے۔ اس تصویر پر ایک 3cm چوڑائی کا لکڑی کا فریم ہے۔ اگر تصویر کا رقبہ $234cm^2$ ہو تو تصویر کی لمبائی اور چوڑائی معلوم	08	OR	Find the values of x and y from: $(1-2i)x+y=4$ $x+(2+i)y=5$

Evaluate: $\frac{(1+i)^2}{6-2i}$ and express the result in the from $a+bi$	**04**

08	OR	Solve the following system of linear equations: $(2+i)x - y = 1$ $x + (1-i)y = 2$

(ii)	Evaluate. حل کریں۔ $\left(-1+\sqrt{-3}\right)^4+\left(-1-\sqrt{-3}\right)^4$	04	OR	The ages of workers working in a hotel are mentioned as below. Draw histogram to represent the data.

Ages in years	15-20	21-25	26-30	31-35	36-40
No of workers	5	10	8	12	4

04

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Quadratic Equations-I

Domain A: Numbers and Algebra

FBISE model paper | Section A Q1(ii) | 1 mark

ii.	If α, β are the roots of $2x^2 - 4x - 8 = 0$ then value of the product $\alpha\beta$ is:	-4	-2	2	4

FBISE model paper | Section A Q1(vi) | 1 mark

vi.	The discriminant of $x^2 - 3x - 4 = 0$ is:	9	12	16	25

FBISE model paper | Section B Q2(i) OR | 4 marks

OR	Square of two times a number is equal to the difference of four times the number and 1. Find the number.	4

No.		
Q.3	Area of a rectangular park is 1500 square metres and perimeter is 160 metres. Find the length and width of the park.	8

If α, β are roots of given equation then form an equation whose roots are $\alpha^2\beta, \alpha\beta^2$ $x^2 - 3x + 6 = 0$	04

4	Solve simultaneous equations $x^2 + y^2 = 20$ $6x^2 + xy - y^2 = 0$	08	OR	Construct two intersecting circles of radii $3.5cm$ and $4.5cm$ whose centers are $6cm$ apart. Also draw two direct common tangents to circles. Also write steps of construction.	08

First Annual 2025 | Section B Q2(i) OR | 4 marks

Solve simultaneous equations: $2x + y = 1,\ x^2 + y^2 = 10$ دی گئی ہمزاد مساواتیں حل کریں۔	04

First Annual 2025 | Section B Q2(ii) | 4 marks

If α, β are roots of given equation then find value of $(\alpha - \beta)^2$ $x^2 - 8x + 20 = 0$	04

Second Annual 2025 | Section B Q2(ii) | 4 marks

If α, β are roots of given equation $2x^2+3x-4=0$ then find the sum and product of α^2 and β^2. اگر α, β مساوات $2x^2+3x-4=0$ کے روٹس ہوں تو پھر α^2 اور β^2 کا	04

Second Annual 2025 | Section B Q2(vi) OR | 4 marks

Find the value of "k" if "1" is root of given polynomial. x^3-2kx^2+11	04

Second Annual 2025 | Section C Q2(vi) | 3 marks

(iv) مساوات کو بذریعہ تجزی حل کریں۔ $x^2 - 8px + 12p^2 = 0$

(v) معیاری مساوات $ax^2 + bx + c = 0$ کا حل سیٹ درج شدہ قیمتوں کے لیے معلوم کیجیے۔ $a = 2, b = -9, c = 9$

First Annual 2026 | Section B Q2(i) OR | 4 marks

The product of two consecutive positive integers is 132. Form a quadratic equation and find the integers.	04

	بنائیں۔	04	OR	علی ایک کام 6 گھنٹوں میں جبکہ احمد 12 گھنٹوں میں مکمل کرتا ہے۔ ایک مساوات بنائیں جو ان دونوں کے اکٹھے کام کرنے پر وقت معلوم کرے اور وہ اس کام کو x گھنٹوں میں مکمل کریں۔	04
(iv)	a. Solve the given equation b. Express the solution on a number line. $\left\|\frac{2x-4}{6}\right\| = \frac{4}{3}\ ; x \in R$ درج مساوات حل کریں۔ نیز اس کا حل نمبر لائن پر ظاہر کریں۔	04	OR	Sketch the graph of the quadratic function $y = x^2 - 4$ and identify its vertex. مربعی مساوات $y=x^2-4$ کا گراف بنائیں۔ اس کے ورٹیکس کی نشان دہی بھی کریں۔	04
(v)	Find the values of x and y from the cyclic			A point $P(-1,4)$ is translated by a vector $v = [3,-2]$ to a	

First Annual 2026 | Section C Q3 | 8 marks

Q.3	A rectangular garden has a length 4m more than its width. A 2m wide path is constructed all-round the garden. If area of the path is $64m^2$. Find dimensions of the garden. ایک مستطیل باغ کی لمبائی اس کی چوڑائی سے 4m زیادہ ہے۔ اس باغ کے چاروں طرف ایک	**08**

First Annual 2026 | Section A Q2 | 1 mark

If α, β are the roots of $2x^2 - 4x + 1 = 0$, then α + β equals: اگر α اور β مساوات $2x^2 - 4x + 1 = 0$ کے روٹس ہوں تو α + β کی	2	$\frac{1}{2}$	−2	4	○ ○ ○ ○

First Annual 2026 | Section A Q6 | 1 mark

The discriminant of $2x^2 - 3x - 2 = 0$ is: مساوات $2x^2 - 3x - 2 = 0$ کا فرق کنندہ کیا ہوگا؟	1	−7	25	5	○ ○ ○ ○

FBISE model paper | Section A Q1(2) | 1 mark

(2) For what value of k, $2x^2 + kx + 3 = 0$ has equal roots?

A. $2\sqrt{6}$ B. 24

C. $\pm 2\sqrt{6}$ D. $\pm 6\sqrt{2}$

FBISE model paper | Section A Q1(4) | 1 mark

(4) If α and β are the roots of $2x^2 - 6x - 4 = 0$. What is value of $\alpha^2\beta^3 + \alpha^3\beta^2$?

A. -12 B. 12

C. 6 D. -6

FBISE model paper | Section B Q2(ii) | 4 marks

ii. Show that the equation $\frac{x+3}{x^2} + \frac{x-1}{(mx+c)^2} = \frac{6}{a^2}$ has equal roots if $c^2 = a^2(1 + m^2)$

OR

If θ and φ are the roots of $y^2 - 7y + 9 = 0$, then form an equation whose roots are 2θ and 2φ.

Q.3 The area of a rectangle is $48cm^2$. If length and width of each are increased by 4cm. the area of larger rectangle is increased by $12cm^2$. Find the length and width of the original rectangle.

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Matrices and Determinants

Domain A: Numbers and Algebra

FBISE model paper | Section A Q1(iii) | 1 mark

iii.	What is the value of y, if $\begin{bmatrix} 3 & 5 \\ 8 & y+9 \end{bmatrix}\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}=\begin{bmatrix} 3 & 5 \\ 8 & -2y \end{bmatrix}$?	3	-3	-9	9

FBISE model paper | Section B Q2(ii) | 4 marks

ii.	If $T=\begin{bmatrix} 1 & -2 \\ 3 & 3 \end{bmatrix}$, then a. Find T^{-1} b. Show that $TT^{-1}=I$	4

Second Annual 2025 | Section B Q2(vi) | 3 marks

Q. 2 Attempt any TWELVE parts.

(i) Identify the open sentences:
a) $7-3>12$ b) $3x+5x=8x$ c) $3+5<$

(ii) Plot the points on graph paper (3,-6), (-3,-4), (4, 2).

(iii) Plot the graph by taking only two points. $2x-5=-13y$

(iv) Solve the equation by factorization. $x^2-8px+12p^2=0$

(v) Find the solution set of standard equation $ax^2+bx+c=0$

(vi) Eliminate x by comparison method $2x+3y=5$, $x-y=2$.

(vii) For what value of ... the ratio ... is ...

First Annual 2026 | Section A Q1(iv) | 1 mark

A. $3>2$ B. ...

(iv) At least two equations are required for _____ of one variable.
A. Ratio B. Proportion C. Elimination D. Information handling

First Annual 2026 | Section B Q2(ii) | 4 marks

(ii)	Find inverse of given matrix if it is possible. $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ اگر ممکن ہو تو درج قالب کے لیے A^{-1} معلوم کریں۔	04
(iii)	Plot the graph of a linear function $y = 2x - 1$	

First Annual 2026 | Section A Q3 | 1 mark

If A is a matrix of order 2×3 and B is a matrix of order 3×2, then order of AB is: اگر قالب A کا مرتبہ 2×3 اور قالب B کا مرتبہ 3×2 ہو AB کا مرتبہ کیا ہو گا؟	2×2	3×3	2×3	3×2	○ ○ ○ ○

First Annual 2026 | Section B Q2(ii) | 4 marks

Find inverse of the matrix if possible $A = \begin{bmatrix} 3 & -1 \\ 2 & 1 \end{bmatrix}$. اگر ممکن ہو تو درج قالب کے لیے A^{-1} معلوم کریں۔	04
Draw graph of the absolute value function $y = \lvert x \rvert$ for	

First Annual 2026 | Section B Q2(vi) | 4 marks

Find inverse of the matrix A is possible $A = \begin{bmatrix} 5 & -2 \\ 3 & 1 \end{bmatrix}$	04

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Functions and Graphs

Domain A: Numbers and Algebra

FBISE model paper | Section A Q1(iv) | 1 mark

iv.	If $f(x)=\frac{1}{2}x$, then what is the value of $f^2(x)$?	$\frac{1}{2}x$	$\frac{1}{4}x$	$\frac{1}{4}x^2$	$\frac{4}{x^2}$

FBISE model paper | Section B Q2(ii) OR | 4 marks

OR	If $f(x)=2x+1$, $g(x)=(3x-1)^2$ then find a. $fog(x)$ b. $gof(x)$.	4

(iv)	For given sets verify that $(A-B)' = A' \cup B$ $U = \{1,2,3...10\}\ A = \{1,3,5,7,9\},\ B = \{2,3,4,5,8\}$ $(A-B)' = A' \cup B$ دیے گئے سیٹس کے لیے پڑتال کریں کہ	04	OR	If $v \propto \frac{1}{r^3}$ and $v = 5$ when $r = 3$. Find value of v when $r = 6$ اگر $v \propto \frac{1}{r^3}$ اور $v = 5$ جب $r = 3$ ہے۔ تو v کی قیمت معلوم کریں جب $r = 6$ ہو تو:	04

.4	If $L=\{x \mid x \in O \wedge x \leq 7\}; M=\{x \mid x \in P \wedge x<9\}$ then find: **i.** $M \times L$ **ii.** One into function **iii.** One 1-1 function **iv.** One injective function **v.** One bijective function **vi.** One onto function اگر $L=\{x \mid x \in O \wedge x \leq 7\}; M=\{x \mid x \in P \wedge x<9\}$ تو معلوم کریں۔	08

.4	If $L=\{x \mid x \in O \wedge x \leq 7\}; M=\{x \mid x \in P \wedge x<9\}$ then find: **i.** $M \times L$ **ii.** One into function **iii.** One 1-1 function **iv.** One injective function **v.** One bijective function **vi.** One onto function اگر $L=\{x \mid x \in O \wedge x \leq 7\}; M=\{x \mid x \in P \wedge x<9\}$ تو معلوم کریں۔	08

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.4	If $L=\{x \mid x \in O \wedge x \leq 7\}; M=\{x \mid x \in P \wedge x<9\}$ then find: **iv.** One injective function **v.** One bijective function **vi.** One onto function اگر $L=\{x \mid x \in O \wedge x \leq 7\}; M=\{x \mid x \in P \wedge x<9\}$ تو معلوم کریں۔	08

.4	If $L=\{x \mid x \in O \wedge x \leq 7\}; M=\{x \mid x \in P \wedge x<9\}$ then find: **iv.** One injective function **v.** One bijective function **vi.** One onto function اگر $L=\{x \mid x \in O \wedge x \leq 7\}; M=\{x \mid x \in P \wedge x<9\}$ تو معلوم کریں۔	08

.4	If $L=\{x \mid x \in O \wedge x \leq 7\}; M=\{x \mid x \in P \wedge x<9\}$ then find:	
	vi. One onto function	
	اگر $L=\{x \mid x \in O \wedge x \leq 7\}; M=\{x \mid x \in P \wedge x<9\}$ تو معلوم کریں۔	08

First Annual 2026 | Section B Q2(ii) OR | 4 marks

(ii)	Find inverse of given matrix if it is possible. $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ اگر ممکن ہو تو درج قالب کے لیے A^{-1} معلوم کریں۔	04	OR	If $f(x) = 2x + 1$ and $g(x) = x - 3$, find $f(g(x))$ and $g(f(x))$. اگر $f(x) = 2x + 1$ اور $g(x) = x - 3$ ہوں تو $f(g(x))$ اور $g(f(x))$ معلوم کریں۔	04
(iii)	Plot the graph of a linear function $y = 2x - 1$ for $x = -2, -1, 0, 1, 2$			Ali can complete a task in 6 hours and Ahmed in 12 hours. Form an equation to find the time taken when	

First Annual 2026 | Section B Q2(ii) OR | 4 marks

OR	دو مثبت اعداد کا حاصل ضرب 85 ہے۔ اعداد معلوم کریں۔	04
OR	If $f(x) = x + 1$ and $g(x) = x - 1$, find $g(f(x))$ and $f(g(x))$. اگر $f(x) = x + 1$ اور $g(x) = x - 1$ ہوں تو $g(f(x))$ اور $f(g(x))$ معلوم کریں۔	04

First Annual 2026 | Section B Q2(vi) OR | 4 marks

OR	Given $f(x) = 4x$ and $g(x) = x^2$, find the composite functions $(fof)(x)$ and $(gog)(x)$. اگر $f(x) = 4x$ اور $g(x) = x^2$ ہوں تو $(fof)(x)$ اور $(gog)(x)$ معلوم کریں۔	04

First Annual 2026 | Section C Q4(ii) | 1 mark

Q.4	If $A = \{2,4,6\}$ and $B = \{1,3,7\}$ then find following if possible.

(i) $A \times B$
(ii) One into function
(iii) One surjective fun

First Annual 2026 | Section C Q4(iii) | 1 mark

Q.4	If $A = \{2,4,6\}$ and $B = \{1,3,7\}$ then find following if possible.

(ii) One into function
(iii) One surjective function
(iv) One 1-1 function

First Annual 2026 | Section C Q4(iv) | 1 mark

Q.4	If $A=\{2,4,6\}$ and $B=\{1,3,7\}$ then find following if possible.	
	(iii) One surjective function	(ii) ایک اِن ٹو تفاعل۔
	(iv) One 1-1 function	
	(v) One injective function	(iii) ایک سرجیکٹیو تفاعل۔
	(vi) One bijective function	

First Annual 2026 | Section C Q4(v) | 1 mark

Q.4	If $A=\{2,4,6\}$ and $B=\{1,3,7\}$ then find following if possible.	
	(iv) One 1-1 function	(ii) ایک اِن ٹو تفاعل۔
	(v) One injective function	(iii) ایک سرجیکٹیو تفاعل۔
	(vi) One bijective function	

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Graphs of Basic Functions

Domain A: Numbers and Algebra

FBISE model paper | Section A Q1(v) | 1 mark

v.	If $\lvert x-5\rvert=-3$, then the value of x is:	8	-8	2	ϕ

FBISE model paper | Section B Q2(iii) | 4 marks

iii.	For an absolute function $f(x)=\lvert x-2\rvert$ a. Construct table of values b. Plot the graph	4

FBISE model paper | Section B Q2(iv) | 4 marks

iv.	Solve the inequality: $\left\|\frac{2-5x}{4}\right\| \geq \frac{2}{3}$	4

Second Annual 2025 | Section B Q2(iii) | 3 marks

Q. 2 Attempt any TWELVE parts.

(i) Identify the open sentences:

a) $7-3>12$ b) $3x+5x=8x$ c) $3+5$

(ii) Plot the points on graph paper (3,-6), (-3,-4), (4, 2).

(iii) Plot the graph by taking only two points. $2x-5=-13y$

First Annual 2026 | Section B Q2(xii) | 3 marks

(xii) Plot the graph by taking two points: $3x-4=5y$

First Annual 2026 | Section B Q2(iii) | 4 marks

Plot the graph of a linear function $y = 2x - 1$ for $x = -2, -1, 0, 1, 2$.

$y=2x-1$ دی گئی مساوات کے لیے $x=-2, -1, 0, 1, 2$ قیمتوں پر گراف

04

First Annual 2026 | Section A Q5 | 1 mark

The solution of $|x - 2| = 4$ is:

$|x - 2| = 4$ کا حل کیا ہوگا؟

$x = 6$ or $x = 2$	$x = 6$	$x=6$ or $x = -2$	$x = 2$

First Annual 2026 | Section B Q2(iii) | 4 marks

Draw graph of the absolute value function $y = \|x\|$ for $-4 \le x \le 4$. دی گئی مساوات $y = \|x\|$ کے لیے $-4 \le x \le 4$ قیمتوں پر گراف بنائیں۔	04

First Annual 2026 | Section B Q2(iv) | 4 marks

(iv)	a. b.	Solve the inequality and Express the solution in interval notation. $\frac{\|x+2\|}{3} \le 6; x \in R$	04

First Annual 2026 | Section B Q2(vii) | 4 marks

Draw the graph of $y = \|x - 2\|$ for $x=1,2,3,4$. دی گئی مساوات $y = \|x - 2\|$ کے لیے $x=1,2,3,4$ قیمتوں پر گراف بنائیں۔	04

First Annual 2026 | Section B Q2(viii) | 4 marks

Solve the given inequality and represent the solution set on a number line. $\|2x-1\| \leq \|x+4\|; x \in R$	04

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Algebraic Fractions

Domain A: Numbers and Algebra

FBISE model paper | Section A Q1(xiv) | 1 mark

xiv.	The simplified form of the expression $\frac{2x^2-2x}{x+1}\times\frac{2x^2+2x}{x-1}$ is:	$2x$	$2x^2$	$4x$	$4x^2$	○ ○ ○ ○

FBISE model paper | Section B Q2(iii) OR | 4 marks

OR	Two workers, Saqib and Aqib, are hired to clean a large warehouse. Saqib can clean the entire warehouse in 5 hours, while Aqib can clean it in 7 hours. They start cleaning together, but after two hours, Saqib leaves, and Aqib continuous cleaning alone. How long will it take Aqib to finish cleaning the warehouse after Saqib leaves?	4

FBISE model paper | Section B Q2(viii) OR | 4 marks

OR	Solve the fractional equation $\frac{2x}{x-3}+\frac{4}{x+2}=\frac{10}{x^2-x-6}$	4

First Annual 2025 | Section B Q2(iii) | 4 marks

Resolve into partial fractions. $\frac{3x+7}{(x+3)(x^2+4)}$ جزوی کسروں میں تحلیل کریں۔	04

First Annual 2025 | Section B Q2(vi) OR | 4 marks

Resolve into partial fractions	$\frac{2x-1}{(x+2)^2(x-3)}$	جزوی کسروں میں تحلیل کریں۔	04

First Annual 2025 | Section B Q2(iii) OR | 4 marks

(iii)	Using componendo-dividendo property to prove that $a:b=c:d$ if $\frac{5a+7b}{5a-7b}=\frac{5c+7d}{5c-7d}$	04	OR	Resolve into partial fractions $\frac{7x+4}{(3x+2)(x+1)^2}$	04

First Annual 2025 | Section B Q2(iii) | 4 marks

(iii)	Using componendo-dividendo property to prove that $a:b=c:d$ if $\frac{5a+7b}{5a-7b}=\frac{5c+7d}{5c-7d}$	$a:b=c:d$ مسئلہ ترکیب وتفصیل نسبت سے ثابت کریں کہ

First Annual 2025 | Section B Q2(vii) OR | 4 marks

OR	Resolve into partial fractions $\frac{11x-6}{(x+2)(x^2+3)}$	جزوی کسروں میں تحلیل کریں۔	04

Second Annual 2025 | Section C Q3 OR | 8 marks

OR	Resolve into partial fractions $\frac{7x+4}{(x+2)(x-1)^2}$	08

Second Annual 2025 | Section A Q1(v) | 1 mark

(v) If $x:y=a:b$, then $\frac{x}{y}=$ _____

A. $\frac{a}{b}$ B. $\frac{b}{a}$ C. $a\times b$ D. $a+b$

Second Annual 2025 | Section A Q1(vii) | 1 mark

(vii) Eliminating x from the equations $x=\frac{1}{3n}$ and $x=2m$ we get:

A. $2mn=1$ B. $m=3n$ C. $2m=n$ D. $6mn=1$

Second Annual 2025 | Section A Q1(xii) | 1 mark

(xii) If $5:8=5:x$ then $x=$ _____

A. 5 B. 25 C. 40 D. 8

First Annual 2026 | Section B Q2(i) | 3 marks

(i) If $a:b=3:4$, find $5a+4b:6a+9b$

First Annual 2026 | Section B Q2(ii) | 3 marks

(ii) Find the fourth proportional: $3a^2b^2, 5ab^2, 9ab$

First Annual 2026 | Section B Q2(v) | 3 marks

(iv) The arithmetic mean of 45 numbers is 80. Find their sum.

(v) For what value of m, the ratio $6m+4:8m+2$ is equal to the ratio $4:5$.

(vi) The grades of a student in six examinations were 82, 91,74,68,80 a

First Annual 2026 | Section B Q2(iii) OR | 4 marks

Ali can complete a task in 6 hours and Ahmed in 12 hours. Form an equation to find the time taken when they work together and complete the task in x hours.	04

Simplify: حل کریں۔ $\frac{x^2-5x+6}{x^2-4}\times\frac{x+2}{x^2+x-6}$	04

OR	دو مس مثبت اعداد کا حاصل ضرب 85 ہے۔ اعداد معلوم کریں۔	04
OR	If $f(x) = x + 1$ and $g(x) = x - 1$, find $g(f(x))$ and $f(g(x))$. اگر $f(x) = x + 1$ اور $g(x) = x - 1$ ہوں تو $g(f(x))$ اور $f(g(x))$ معلوم کریں۔	04
OR	Two pipes can fill a tank separately in 8 hours and 12 hours. Form a rational equation to determine the time taken to fill the tank together. دو پائپ ایک ٹینک کو علیحدہ علیحدہ بالترتیب 8 گھنٹوں اور 12 گھنٹوں میں بھر سکتے ہیں۔ ایک ناطق	04

First Annual 2026 | Section B Q2(iii) OR | 4 marks

OR	Simplify: حل کریں۔ $\frac{x^2+4x+3}{x^2+3x+2} \times \frac{(x-1)(x+2)}{x^2+8x+15}$	04

First Annual 2026 | Section B Q2(ix) | 4 marks

(ix)	A cyclist covers a distance of *60 km* at a speed of *(x + 5) km/h*. If the cyclist increases speed by *5km/h*, he covers the same distance in 2hrs less. Write down the rational equation in *x*. ایک سائیکلسٹ *(x + 5) km/h* کی رفتار پر *60 km* کا فاصلہ طے کرتا ہے۔ اپنی سپیڈ	04	OR	A tr upv a. b. ے۔

APOLLO

Linear Inequalities in Two Variables

Domain A: Numbers and Algebra

FBISE model paper | Section B Q2(v) | 4 marks

v.	Shade the solution region bounded by a pair of linear inequalities: $x+y\leq 50$; $x-y\geq 10$; $x\geq 0$; $y\geq 0$	4

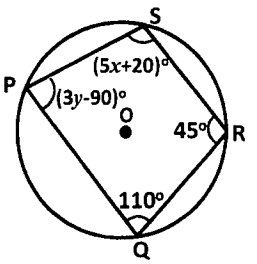
Second Annual 2025 | Section B Q2(i) | 3 marks

Q. 2 Attempt any TWELVE parts.

(i) Identify the open sentences:

a) $7-3>12$ b) $3x+5x=8x$ c) $3+5<2x$

Shade the region bounded by the linear inequalities $x+y\leq 6 \qquad x-y\geq -7; x, y \in R$. درج خطی عدم مساوات سے گھرا ہوا ریجن گراف پر شیڈ کی مدد سے ظاہر کریں۔	04

	form $a+bi$ مختصر کریں اور $\frac{(1+i)}{(2+i)(3-i)}$ اور جواب $a+bi$ کی شکل میں لکھیں۔	04	OR
ii)	Find inverse of the matrix if possible $A=\begin{bmatrix}3 & -1\\ 2 & 1\end{bmatrix}$. اگر ممکن ہو تو درج قالب کے لیے A^{-1} معلوم کریں۔	04	OR
iii)	Draw graph of the absolute value function $y = \|x\|$ for $-4 \le x \le 4$. دی گئی مساوات $y = \|x\|$ کے لیے $-4 \le x \le 4$ قیمتوں پر گراف بنائیں۔	04	OR
(iv)	a. Solve the inequality and b. Express the solution in interval notation. $\frac{\|x+2\|}{3} \le 6; x \in R$ درج مساوات حل کریں۔ نیز اس کا حل انٹرول نوٹیشن میں ظاہر کریں۔	04	OR
(v)	Find the values of x and y from the cyclic quadrilateral $PQRS$ inscribed in a circle. دائرے میں محصور سائیکلک چوکور $PQRS$ میں x اور y کی ویلیوز معلوم کریں۔ 	04	OR
(vi)	i. Find vector $2\underline{a}-\underline{b}$. ii. Find a unit vector in the direction of $2\underline{a}-\underline{b}$ $\underline{a}=\hat{i}+2\hat{j}$ $\underline{b}=3\hat{i}-\hat{j}$, الف۔ ویکٹر $2\underline{a}-\underline{b}$ معلوم کریں۔ ب۔ $2\underline{a}-\underline{b}$ کی سمت میں یونٹ ویکٹر معلوم کریں۔	04	OR
(vii)	From the top of a tower 20 m high, the angle of depression of a point P on the ground is 60°. Find the horizontal distance of the point from the tower. ایک مینار کی چوٹی سے زمین پر ایک نقطہ P کا نزولی زاویہ 60° ہے۔ نقطہ P اور مینار کا افقی فاصلہ معلوم کریں۔	04	OR
(viii)	Two cards are drawn successively without replacement from a deck of 52 cards. Find the probability that both are Kings. تاش کے 52 پتوں میں سے 2 پتے یکے بعد دیگرے نکالے گئے اس بات کا کیا امکان ہے کے دونوں پتے بادشاہ کے ہیں۔	04	OR
(ix)	Determine the solution region for the inequalities $x+y \ge -5$ $x-y \ge 5; x \in R$ درج خطی عدم مساواتوں کے حل کا خطہ (ریجن) معلوم کریں۔	04	OR

Shade the solution region bounded by the linear inequalities $2x-3y\leq -12 \quad 2x+3y\geq 12$	**04**

APOLLO

Quadratic Equations-II

Domain A: Numbers and Algebra

FBISE model paper | Section B Q2(vi) OR | 4 marks

Find the solution set of the equation: $\frac{1}{x}-\frac{11}{\sqrt{x}}=-18$.	4

First Annual 2025 | Section B Q2(i) | 4 marks

(i)	Solve by using Quadratic formula $3(x-2)^2=x(x-2)$۔ دودرجی فارمولہ کی مدد سے حل کریں۔	04

Second Annual 2025 | Section B Q2(i) | 4 marks

(i)	Solve by factorization $3x^2 - 2x = (x-2)^2$ بذریعہ تجزی حل کریں۔	04

Second Annual 2025 | Section B Q2(v) OR | 4 marks

Solve the equation $3x^{-2} + 5 = 8x^{-1}$ مساوات $3x^{-2} + 5 = 8x^{-1}$ کو حل کریں۔	04

Q.3	The sum of the coordinates of a point is 6 and sum of their squares is 20. Find the coordinates of the point. ایک نقطہ کے محددات کا مجموعہ 6 اور ان کے مربعوں کا مجموعہ 20 ہے۔ نقطہ کے محددات معلوم	**08**

Second Annual 2025 | Section B Q2(iv) | 3 marks

Q. 2 Attempt any TWELVE parts.

(i) Identify the open sentences:
a) $7-3>12$ b) $3x+5x=8x$ c) $3+5$

(ii) Plot the points on graph paper (3,-6), (-3,-4), (4, 2).

(iii) Plot the graph by taking only two points. $2x-5=-13y$

(iv) Solve the equation by factorization. $x^2-8px+12p^2=0$

Second Annual 2025 | Section B Q2(v) | 3 marks

Q. 2 Attempt any TWELVE parts. **(12 x**

(i) Identify the open sentences:
a) $7-3>12$ b) $3x+5x=8x$ c) $3+5<2x$

(ii) Plot the points on graph paper (3,-6), (-3,-4), (4, 2).

(iii) Plot the graph by taking only two points. $2x-5=-13y$

(iv) Solve the equation by factorization. $x^2-8px+12p^2=0$

(v) Find the solution set of standard equation $ax^2+bx+c=0$ for the following values $a=2, b=-9, c=9$

Q. 2 Attempt any TWELVE parts.

(i) Identify the open sentences:
a) $7-3>12$ b) $3x+5$

(ii) Plot the points on graph paper

(iii) Plot the graph by taking only tw

(iv) Solve the equation by factoriza

(v) Find the solution set of standar

(vi) Eliminate x by comparison met

(vii) For what value of x, the ratio $3-$

(viii) If $x:y=3:2$, the find $2x+3y:4$

(ix) Find the fourth proportional of

(x) Find the mean proportional of 1

(xi) A group of 10th class students
33, 40, 58, 45, 46, 43, 45, 45, 5
44. Classify the data into a freq
Also find the class interval with

(xii) The following are the runs mad

Students	Hussain	H
Runs (1st day)	55	4
Runs (2nd day)	80	6

Draw a suitable diagram/graph

(xiii) What is mean? Write the formu

(xiv) Following are the earning in (Rs

(xv) Ten boys work on a petrol pum
450, 430, 450, 439. Find arithm

(xvi) Find the third proportional of 3,

(xvii) Factorize: $4x^2+2x-6=0$

Second Annual 2025 | Section C Q2(v) | 3 marks

$2x-5=-13y$ مساوات کا گراف کم از کم دو نقاط لے کر بنائیں۔ (iii)

$x^2-8px+12p^2=0$ مساوات کو بذریعہ تجزی حل کریں۔ (iv)

First Annual 2026 | Section B Q2(ix) | 3 marks

(viii) Find the third proportional of $7a^2b$, $14a^2b^2$.

(ix) Find the solution set of the standard quadratic equation $ax^2+bx+c=0$ for the following values:

$a=2, b=-9, c=9$

(x) Plot the following points on graph paper (–3, –5), (3, –6), (4, 2).

First Annual 2026 | Section B Q2(xi) | 3 marks

(x) Plot the following points on graph

(xi) Factorize: $2y^2+5y-3=0$

First Annual 2026 | Section C Q1(vii) | 3 marks

(vi) ایک طالبہ کے درجات چھ امتحانوں میں 4,68,80

(vii) تجزی کریں: $4x^2+2x-6=0$

First Annual 2026 | Section C Q1(xi) | 3 marks

(x) نقاط $(-3,-5),(3,-6),(4,2)$ کو گراف پیپر پر

(xi) تجزی کریں: $2y^2+5y-3=0$

First Annual 2026 | Section B Q2(vi) OR | 4 marks

OR	Solve: حل کریں: $\frac{2}{x-1}+\frac{3}{x+1}=1,\ x\in R$	04

First Annual 2026 | Section A Q15 | 1 mark

15. $x^2+5x+6=$ | $(x-1)(x-6)$ | $(x-2)(x-3)$ | $(x+1)(x+6)$ | $(x+2)(x+3)$ | ◯ ◯ ◯

OR	The sum of the squares of two consecutive integers is 85. Find the integers. دو مسلسل مثبت اعداد کا حاصل ضرب 85 ہے۔ اعداد معلوم کریں۔	04

OR	دو مسلسل مثبت اعداد کا حاصل ضرب 85 ہے۔ اعداد معلوم کریں۔	04
OR	If $f(x) = x + 1$ and $g(x) = x - 1$, find $g(f(x))$ and $f(g(x))$. اگر $f(x) = x + 1$ اور $g(x) = x - 1$ ہوں تو $g(f(x))$ اور $f(g(x))$ معلوم کریں۔	04
OR	Two pipes can fill a tank separately in 8 hours and 12 hours. Form a rational equation to determine the time taken to fill the tank together. دو پائپ ایک ٹینک کو علیحدہ علیحدہ بالترتیب 8 گھنٹوں اور 12 گھنٹوں میں بھرتے ہیں۔ ایک ناطق مساوات بنائیں جو دونوں پائپوں سے اکٹھے ٹینک بھرنے کا وقت بتائے۔	04
OR	Draw graph of a cubic function $y = x^3$ for $-2 \le x \le 2$. مکعب تفاعل $y = x^3$ کا $-2 \le x \le 2$ تک گراف بنائیں۔	04
OR	A point $A(4,-3)$ is translated to a point $B(9,1)$. a. Find the translation vector that maps A to B. b. Using the same vector, determine the image of point $C(-2,5)$ نقطہ $A(4,-3)$ نقطہ $B(9,1)$ تک ٹرانسلیٹ ہو رہا ہے۔ الف۔ A سے B ٹرانسلیشن کا ویکٹر معلوم کریں۔ ب۔ ویکٹر کو استعمال کرتے ہوئے نقطہ $C(-2,5)$ کی امیج معلوم کریں۔	04
OR	Solve: حل کریں: $\frac{1}{x+2} + \frac{1}{x-2} = 1; x \in R$.	04

Q.3	A rectangular painting has length 5cm more than its width. A wooden frame of uniform width 3cm is fixed around it. If total area of the framed picture is $234cm^2$, find the dimensions of the painting. ایک مستطیلی تصویر کی لمبائی اس کی چوڑائی سے 5cm زیادہ ہے۔ اس تصویر پر ایک 3cm	**08**

First Annual 2026 | Section B Q2(i) OR | 4 marks

OR	$\frac{3}{x-1}-\frac{1}{x+1}=1; x \in R$.	**04**

First Annual 2026 | Section B Q2(v) OR | 4 marks

- and express the result in the from	**04**	**OR**	The product of two numbers is 55 and their difference is 6. Find the numbers by forming a quadratic equation. دو اعداد کا حاصل ضرب 55 اور ان کا فرق 6 ہے۔ ایک دودرجی مساوات بنا کر اعداد معلوم	**04**

Q.4	A farmer wants to fence a rectangular field having perimeter 120 m and area 800m^2. Using quadratic equations, find the dimensions of the field.

04	OR	Find the dimensions of rectangle, whose perimeter is $80cm$ and its area is $375cm^2$. ایک مستطیل کے اضلاع معلوم کیجیے۔ جس کا احاطہ 80 سم اور اس کا رقبہ 375 مربع سم ہے۔

Q.3	The area of rectangular table is $75cm^2$. Suppose the length of table is $5cm$ more than twice its width. Then what will be its length and width?	**08**

FBISE model paper | Section B Q2(i) | 4 marks

Q.2 Attempt **ALL** parts. Each part carries **(04)** marks.

i. Solve the equation $3x^2 + 4x - 5 = 5x^2 + 2x + 1$.

FBISE model paper | Section B Q2(i) OR | 4 marks

OR

Solve the equation $\frac{x-1}{x+3} + \frac{x+3}{x-1} = \frac{13}{6}$

APOLLO

Plotting and Interpreting Graphs

Domain A: Numbers and Algebra

	ground. Ignore air resistance.	
Q.5	Solve $f(x)=2x+5$, and $g(x)=2x^2+1$ graphically.	8

Q.5	Draw a circle of radius 4 cm. At a point outside the circle, construct two tangents to the circle making an angle of 60° with each other. Write the steps of construction. 4cm رداس کا ایک دائرہ کھینچیں۔ دائرہ سے باہر ایک نقطہ سے دائرہ پر دو مماس ایسے کھینچیں کہ ان کا باہمی زاویہ 60° ہو۔ تشکیل کے مراحل تحریر بھی کریں۔	**08**	**OR**	Draw graphs of the following equations on the same axes and find their points of intersection. $y = x^2 - 1$ $y = -x + 3$ Interpret the solution obtained from the graph. درج مساوات کے گراف کو ایک ہی محور پر کھینچیں اور ان کے تقاطع کے پوائنٹس کو تلاش کریں۔

Solve the system of equations graphically.

How many solutions exist? Explain their graphical meaning.

$$y = x^2 - 5x + 6$$
$$y = x - 2$$

08

Plot the graphs of the following equations on the same coordinate plane and determine the solutions. Interpret the points of intersection.

$$y = x^2 - 3x$$
$$y = 2x - 4$$

APOLLO

Curves Sketching

Domain A: Numbers and Algebra

FBISE model paper | Section A Q1(xv) | 1 mark

xv.	If $2x+3y=2$, then $y-$intercept is:	1	$\frac{2}{3}$	$\frac{3}{2}$	2	○ ○ ○ ○

FBISE model paper | Section B Q2(iv) OR | 4 marks

OR	Sketch and interpret the graph of an exponential function $f(x)=4^x$	4

First Annual 2026 | Section A Q13 | 1 mark

13. What is the slope of the line $y = 4x + 1$? $y = 4x + 1$ کا ڈھلوان (Slope) کیا ہے؟	1	−4	−1	4	◯

OR	دو مثبت اعداد کا حاصل ضرب 85 ہے۔ اعداد معلوم کریں۔	04
OR	If $f(x) = x + 1$ and $g(x) = x - 1$, find $g(f(x))$ and $f(g(x))$. اگر $f(x) = x + 1$ اور $g(x) = x - 1$ ہوں تو $g(f(x))$ اور $f(g(x))$ معلوم کریں۔	04
OR	Two pipes can fill a tank separately in 8 hours and 12 hours. Form a rational equation to determine the time taken to fill the tank together. دو پائپ ایک ٹینک کو علیحدہ علیحدہ بالترتیب 8 گھنٹوں اور 12 گھنٹوں میں بھرتے ہیں۔ ایک ناطق مساوات بنائیں جو دونوں پائپوں سے اکٹھے ٹینک بھرنے کا وقت بتائے۔	04
OR	Draw graph of a cubic function $y = x^3$ for $-2 \le x \le 2$. مکعب تفاعل $y = x^3$ کا $-2 \le x \le 2$ تک گراف بنائیں۔	04

First Annual 2026 | Section B Q2(viii) OR | 4 marks

		M	
OR	Draw graph of an exponential function $y = 2^x$ for $-2 \leq x \leq 2$. قوت نمائی مساوات $y=2^x$ کا گراف بنائیں۔ جبکہ $-2 \leq x \leq 2$		04

APOLLO

Vectors in Plane

Domain B: Geometry

FBISE model paper | Section A Q1(vii) | 1 mark

vii.	A projectile is launched at an angle of 30° with an initial velocity of 20 m/s. What is the horizontal component of its velocity?	$10\ m/s$	$17.3\ \mathrm{m/s}$	$20\ m/s$	$0\ m/s$

FBISE model paper | Section B Q2(v) OR | 4 marks

OR	Given two points A (2,3) and B (6,8), a vector $\vec{v} = [4,5]$ translates point A to a new point C. a. Determine the coordinates of point C after the translation. b. Verify if the same vector $\vec{v}$ can also translate point B to the point D (10,13). Justify your answer.	4

vi.	Three points A, B and C in the plane are given by the position vectors: $\overrightarrow{OA} = [2, 1],\ \overrightarrow{OB} = [5, -2],\ \overrightarrow{OC} = [1, -3]$ with O (0, 0) as reference point. a. Find $\overrightarrow{AB}$ and $\overrightarrow{AC}$. b. Determine if A, B and C are collinear	4

Q.4	A military drone is flying at a velocity of 150 m/s at an angle of 60° above the horizontal when it releases a package. Due to a wind blowing from east at 40 m/s, the trajectory of the package changes. a. Represent the drone's initial velocity vector and the wind velocity vector in component form. b. Calculate the resultant velocity vector of the package at the moment of release. c. If the package is dropped from a height of 500 m, determine the horizontal displacement of the package before it hits the ground. Ignore air resistance.	8

(ii) The graphical plane have _____ quadrants.

A. 1 B. 2 C. 3 D. 4

Second Annual 2025 | Section A Q1(viii) | 1 mark

(viii) The point at which both lines intersect perpendicularly is called the:

A. *x-axis* B. *y-axis* C. *origin* D. $x' - axis$

Second Annual 2025 | Section B Q2(ii) | 3 marks

Q. 2 Attempt any TWELVE parts.

(i) Identify the open sentences:

a) $7-3>12$ b) $3x+5x=8x$ c) $3+$

(ii) Plot the points on graph paper (3,-6), (-3,-4), (4, 2).

(iii) Plot the graph by taking only two points

First Annual 2026 | Section A Q1(viii) | 1 mark

(viii) The point at which both lines intersect perpendicularly is called the:

A. *x-axis* B. *y-axis* C. $x' - axis$ D. *origin*

First Annual 2026 | Section A Q1(xiii) | 1 mark

(xiii) In $P(2,3)$ the second co–ordinate is 3, it is called:

A. x' B. x C. y D. y'

First Annual 2026 | Section B Q2(x) | 3 marks

$a=2, b=-3, c=3$

(x) Plot the following points on graph paper (–3, –5), (3,–6), (4, 2).

(xi) Factorize: $2x^2+5x-3=0$

First Annual 2026 | Section B Q2(v) OR | 4 marks

A point $P(-1,4)$ is translated by a vector $v=[3,-2]$ to a point Q

a. Determine the coordinates of point Q

b. If another point $R(5,7)$ is translated by $v=[3,-2]$ to a point S. Verify whether $S(8,5)$ is correct.

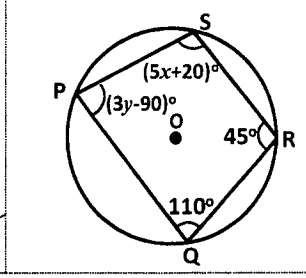
04

نقطہ $P(-1,4)$ کو ویکٹر $v=[3,-2]$ نقطہ Q پر ٹرانسلیٹ کر رہا ہے۔ نقطہ Q کے محددات معلوم کریں۔

اگر ایک اور نقطہ $R(5,7)$ کو بھی ویکٹر $v=[3,-2]$ نقطہ S پر ٹرانسلیٹ کر رہا ہو تو پڑتال کریں کہ $S(8,5)$ درست ہے۔

(vi)	Two points A(1,2) and B(5,6) are given. Find the vector $\overrightarrow{AB}$. Find a unit vector in the direction of $\overrightarrow{AB}$ دو نقاط A(1,2) اور B(5,6) دیے گئے ہیں۔ ویکٹر $\overrightarrow{AB}$ معلوم کریں۔ ویکٹر $\overrightarrow{AB}$ کی سمت میں یونٹ ویکٹر بھی معلوم کریں۔	04	OR	Solve: $\frac{2}{x-1}+\frac{3}{x+1}$
(vii)	A flagstaff is observed from a point P on the ground.			In a circle of radius 13 cm, a

Q.4	Given four points $A(1,2), B(5,2), C(7,6)$ and $D(3,6)$. **a.** If $O(0,0)$ be the reference point, then find the position vectors of points A, B, C and D. **b.** Find vectors $\overrightarrow{AB}$, $\overrightarrow{DC}, \overrightarrow{AD}$ and $\overrightarrow{BC}$ **c.** Using vector method show that *ABCD* is a parallelogram. چار نقاط $A(1,2), B(5,2), C(7,6)$ اور $D(3,6)$ دیے گئے ہیں۔	**08**

)		04	OR	دو مسلسل مثبت اعداد کا حاصل ضرب 85 ہے۔ اعداد معلوم کریں۔	04
$a+bi$ اور جواب $\frac{(1+i)}{(2+i)(3-i)}$ مختصر کریں اور					
e matrix if possible $A=\begin{bmatrix}3 & -1\\ 2 & 1\end{bmatrix}$. اگر ممکن ہو تو درج قالب کے لیے A^{-1} معلوم کریں۔		04	OR	If $f(x)=x+1$ and $g(x)=x-1$, find $g(f(x))$ and $f(g(x))$. اگر $f(x)=x+1$ اور $g(x)=x-1$ ہوں تو $g(f(x))$ اور $f(g(x))$ معلوم کریں۔	04
e absolute value function $y=\|x\|$ for دی گئی مساوات $y=\|x\|$ کے لیے $-4\le x\le 4$ قیمتوں		04	OR	Two pipes can fill a tank separately in 8 hours and 12 hours. Form a rational equation to determine the time taken to fill the tank together. دو پائپ ایک ٹینک کو علیحدہ علیحدہ بالترتیب 8 گھنٹوں اور 12 گھنٹوں میں بھرتے ہیں۔ ایک ناطق مساوات بنائیں جو دونوں پائپوں سے اکٹھے ٹینک بھرنے کا وقت بتائے۔	04
e inequality and the solution in interval notation. $\frac{\|x+2\|}{3}\le 6; x\in R$ درج مساوات حل کریں۔ نیز اس کا حل انٹرول نوٹیشن میں ظ		04	OR	Draw graph of a cubic function $y=x^3$ for $-2\le x\le 2$. مکعب تفاعل $y=x^3$ کا $-2\le x\le 2$ تک گراف بنائیں۔	04
of x cyclic 'QRS e. دائرے 'QRS کریں۔		04	OR	A point $A(4,-3)$ is translated to a point $B(9,1)$. a. Find the translation vector that maps A to B. b. Using the same vector, determine the image of point $C(-2,5)$ نقطہ $A(4,-3)$ نقطہ $B(9,1)$ تک ٹرانسلیٹ ہو رہا ہے۔ الف۔ A سے B ٹرانسلیشن کا ویکٹر معلوم کریں۔ ب۔ ویکٹر کو استعمال کرتے ہوئے نقطہ $C(-2,5)$ کی امیج معلوم کریں۔	04