

The questions increase in complexity throughout the paper and encourage the use of higher-order thinking skills.

**INTRODUCTORY PAPER**

**NUMBER & ARITHMETIC**

**ALGEBRA & PATTERNS**

**MEASURES & UNITS**

**SPACE & GEOMETRY**

**CHANCE & DATA**

**QUESTIONS MAY REQUIRE STUDENTS TO:**

**NUMBER**

- count, order and compare whole numbers to 100
- skip by 2s, 5s, and 10s
- understand place value of whole numbers to 100 and position numbers on the number line
- recognise halves and wholes.

**PATTERNS**

- continue simple linear patterns with numbers and shapes

**MEASURES**

- informally measure and compare mass, length, area, volume and capacity
- measure and compare time in hours, days, weeks, months and years

**SPACE**

- give and follow directions
- identify relative position on a picture or map

**CHANCE**

- give simple estimates of probability in terms of what will happen, might happen and won't happen

**ARITHMETIC**

- use the four operations with single digits using stimulus for multiplication and division
- add and subtract by counting on, partitioning and rearranging
- solve number problems involving whole numbers to 100

**PRE-ALGEBRA**

- solve simple number puzzles expressed in words or symbols

**UNITS**

- no formal units at this level

**SHAPE**

- recognise and classify basic shapes and solids using obvious features
- identify shapes that are the same, similar or different

**DATA**

- complete a basic table
- read a basic table with frequencies and tallies
- read a picture graph

**ALGEBRA**

not tested at this level.

**MEASUREMENT**

- read analog and digital clocks to the half hour

**GEOMETRY**

not tested at this level.



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**PAPER A**

**NUMBER & ARITHMETIC**

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**MEASURES & UNITS**

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**CHANCE & DATA**

**QUESTIONS MAY REQUIRE STUDENTS TO:**

**NUMBER**

- count, order and compare whole numbers to 1000
- place value of whole numbers to 1000
- skip by 2s, 3s, 5s and 10s
- order and compare halves, quarters and eighths

**PATTERNS**

- continue simple linear patterns with numbers and shapes
- identify missing elements in a pattern

**MEASURES**

- informally measure and compare mass, length, area, volume and capacity
- order months and seasons
- read a calendar

**SPACE**

- give and follow directions
- identify relative position on a picture or map
- identify image after one-step flip, slide and half or quarter turns

**CHANCE**

- give simple estimates of probability in terms of likelihood

**ARITHMETIC**

- multiply and divide by single digits using repeated addition, arrays or groups
- solve simple addition and subtraction problems

**PRE-ALGEBRA**

- solve simple number puzzles expressed in words or symbols
- complete number sentences involving addition and subtraction

**UNITS**

- no formal units at this level

**SHAPE**

- describe 2-D and 3-D shapes
- identify shapes or solids that are the same or different

**DATA**

- classify data
- interpret lists, tables and picture graphs
- complete a basic table

**ALGEBRA**

not tested at this level.

**MEASUREMENT**

- read analog and digital clocks to the quarter hour

**GEOMETRY**

not tested at this level.

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**PAPER B**

**NUMBER & ARITHMETIC**

**ALGEBRA & PATTERNS**

**MEASURES & UNITS**

**SPACE & GEOMETRY**

**CHANCE & DATA**

**QUESTIONS MAY REQUIRE STUDENTS TO:**

**NUMBER**

- count, order and compare whole numbers to 10 000
- understand place value of whole numbers to 10 000
- recognise odd and even numbers

**PATTERNS**

**MEASURES**

- estimate, order, measure and compare mass, length, and capacity

**SPACE**

- identify pathways and interpret grid maps for relative position
- identify axes of symmetry

**CHANCE**

- count the number of arrangements of sets of objects and events

**ARITHMETIC**

- solve problems involving unit fractions with denominators of 2, 3, 5 and 10
- multiply and divide by 2, 3, 5 and 10
- use informal factors and multiples of whole numbers to solve problems
- add and subtract to 100

**PRE-ALGEBRA**

- complete number sentences involving the four operations

**UNITS**

- use familiar metric units such as cm, m, km, g, kg, L and mL

**SHAPE**

- identify nets and elevations of 3-D shapes

**DATA**

- read and interpret bar charts, a range of common graphs and two-way tables

**ALGEBRA**

not tested at this level.

**MEASUREMENT**

- read analog and digital clocks
- calculate areas and perimeters using a grid

**GEOMETRY**

- recognise angles as measures of turn
- order and compare angles

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**PAPER C**

**NUMBER & ARITHMETIC**

**ALGEBRA & PATTERNS**

**MEASURES & UNITS**

**SPACE & GEOMETRY**

**CHANCE & DATA**

**QUESTIONS MAY REQUIRE STUDENTS TO:**

**NUMBER**

- count, order and compare numbers from 0.01 to 100 000
- understand place value of numbers from 0.01 to 100 000
- count by halves, thirds, quarters, tenths and hundredths

**PATTERNS**

- sequence numbers in multiples of 2 to 10

**MEASURES**

- use scaled instruments to measure and compare quantities, temperatures and lengths

**SPACE**

- use scales, legends and directions to interpret maps
- complete symmetrical patterns

**CHANCE**

- order likelihood of events
- recognise complementary and independent events

**ARITHMETIC**

- solve problems involving equivalent fractions
- convert decimals to fractions
- use all number facts to 100

**PRE-ALGEBRA**

- solve complex number puzzles expressed in words

**UNITS**

- select appropriate metric units
- choose appropriate order of magnitude
- convert time

**SHAPE**

- informally compare areas of composite or irregular shapes

**DATA**

- select and interpret data appropriate display
- interpret line graphs

**ALGEBRA**

not tested at this level.

**MEASUREMENT**

- compare areas and perimeters using a grid
- solve time problems involving am and pm

**GEOMETRY**

compare angles less than 180°

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**PAPER D**

**NUMBER & ARITHMETIC**

**ALGEBRA & PATTERNS**

**MEASURES & UNITS**

**SPACE & GEOMETRY**

**CHANCE & DATA**

**QUESTIONS MAY REQUIRE STUDENTS TO:**

**NUMBER**

- round numbers
- compare and order fractions and decimals and locate them on the number line

**PATTERNS**

- continue and describe patterns involving fractions, decimals and whole numbers

**MEASURES**

- convert metric units of length

**SPACE**

- connect 3-D objects with 2-D views and nets
- use grid reference and directional language
- identify line and rotational symmetry

**CHANCE**

- list sample space
- represent probabilities as fractions
- recognise probabilities lie from 0 to 1

**ARITHMETIC**

- use factors and multiples to solve problems
- solve problems involving long multiplication and division with remainders
- solve problems involving fractions, mixed numerals and whole numbers
- estimate products

**PRE-ALGEBRA**

- complete equivalent number sentences involving all four operations

**UNITS**

- choose and use appropriate metric units

**SHAPE**

**DATA**

- interpret and compare column graphs, dot plots and tables

**ALGEBRA**

not tested at this level.

**MEASUREMENT**

- calculate areas and perimeters of rectangles
- convert 24-hour time

**GEOMETRY**

- measure and compare angles
- solve problems involving parallel and perpendicular lines

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**PAPER E**

**NUMBER & ARITHMETIC**

**ALGEBRA & PATTERNS**

**MEASURES & UNITS**

**SPACE & GEOMETRY**

**CHANCE & DATA**

**QUESTIONS MAY REQUIRE STUDENTS TO:**

**NUMBER**

- identify and apply properties of prime, composite, square and triangular numbers
- convert between fractions, decimals and percentages

**PATTERNS**

- continue a pattern of related fractions

**MEASURES**

- convert metric units of area and volume

**SPACE**

- apply combinations of transformations to an image
- use the cartesian plane to represent points

**CHANCE**

- represent probabilities as decimals and percentages
- compare experimental and expected frequencies

**ARITHMETIC**

- order integers
- solve problems involving order of operations including decimals and fractions
- add and subtract related fractions
- find fractions of whole numbers
- solve percentage problems such as discounts

**PRE-ALGEBRA**

- complete equivalent number sentences involving order of operations

**MEASUREMENT**

- calculate areas and perimeters of composite shapes including triangles
- interpret timetables

**GEOMETRY**

- apply angle properties including complementary, supplementary, vertically opposite angles and angles at a point
- solve problems involving the angle sum of a triangle

**DATA**

- interpret and compare double column graphs
- interpret sector graphs

**ALGEBRA**

not tested at this level.

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**PAPER F**

**NUMBER & ARITHMETIC**

**ALGEBRA & PATTERNS**

**MEASURES & UNITS**

**SPACE & GEOMETRY**

**CHANCE & DATA**

**QUESTIONS MAY REQUIRE STUDENTS TO:**

**NUMBER**

- use index notation
- represent numbers as product of primes
- find squares and square roots
- compare and order integers and unrelated fractions
- round decimals

**PATTERNS**

- continue patterns involving powers, integers and unrelated fractions

**MEASURES**

**SPACE**

- use simple bearings
- plot and identify co-ordinates in all four quadrants

**CHANCE**

**ARITHMETIC**

- use order of operations with integers and unrelated fractions
- solve ratio problems
- express one quantity as a percentage or fraction of another

**PRE-ALGEBRA**

**MEASUREMENT**

- use formulae to calculate areas of triangles and parallelograms
- calculate volumes of rectangular prisms

**SHAPE**

- classify and use properties of triangles and quadrilaterals

**DATA**

- interpret and compare stem and leaf plots, and dot plots
- calculate mean, median, mode and range

**ALGEBRA**

- create and evaluate algebraic equations using substitution
- interpret authentic graphs and solve linear equations
- simplify expressions

**GEOMETRY**

- calculate angles between transversals and parallel lines
- use angle sum of quadrilaterals to solve problems

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**PAPERS G & H**

**NUMBER & ARITHMETIC**

**ALGEBRA & PATTERNS**

**MEASURES & UNITS**

**SPACE & GEOMETRY**

**CHANCE & DATA**

**QUESTIONS MAY REQUIRE STUDENTS TO:**

**NUMBER**

- apply index laws involving positive and zero indices
- convert terminating and recurring decimals to fractions

**PATTERNS**

- continue patterns involving recurring decimals

**MEASURES**

**SPACE**

**CHANCE**

- find probabilities of events involving 'and', 'or' and 'at least'

**ARITHMETIC**

- use order of operations with integers and rational numbers
- solve ratio and rates problems

**ALGEBRA**

- expand and simplify expressions
- factorise linear expressions
- solve linear equations graphically and algebraically
- change the subject of an equation

**MEASUREMENT**

- calculate areas and perimeters of a kite, rhombus and trapezium
- calculate circumference and areas of circles
- calculate volumes and surface areas of right prisms
- apply Pythagoras' Theorem to solve right-triangle problems

**SHAPE**

- use angle properties of shapes

**DATA**

- interpret two-way tables and Venn diagrams
- recognise effect of outliers on measures of location and spread

**GEOMETRY**

- apply congruence conditions for triangles to solve problems
- use ratio and scale factor of similar figures
- apply angle sum of polygons to solve problems





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### PAPERS I & J (ICAS ONLY)

#### NUMBER & ARITHMETIC

#### ALGEBRA & PATTERNS

#### MEASURES & UNITS

#### SPACE & GEOMETRY

#### CHANCE & DATA

#### QUESTIONS MAY REQUIRE STUDENTS TO:

##### NUMBER

- apply index laws involving integer and fractional indices
- convert numbers to scientific notation

##### ALGEBRA

- apply index laws to simplify expressions
- expand and simplify binomials
- substitute and rearrange to solve equations
- factorise quadratics
- calculate midpoints, distance and gradient
- solve linear inequalities and graph solutions on number lines
- solve linear simultaneous equations
- solve problems involving parallel and perpendicular lines
- graph transformations of parabolas, hyperbolae, polynomials and circles

##### MEASURES

- solve problems with very small time scales and intervals

##### SPACE

- solve problems involving bearings, depression, elevation and area

##### CHANCE

- use two-step probability with and without replacement
- calculate relative frequencies
- calculate probabilities involving 'and' and 'or'
- solve problems involving conditional probability

##### ARITHMETIC

- solve problems involving simple and compound interest
- operate on surds

##### MEASUREMENT

- calculate areas of composite shapes
- calculate surface area and volume of cylinders, cones, spheres and right pyramids

##### GEOMETRY

- use trigonometry to solve 3-D problems
- find unknown sides and angles using sine and cosine rules

##### DATA

- interpret and compare back-to-back stem and leaf plots, and histograms
- compare displays using measures of location and spread
- interpret box plots and scatterplots
- identify quartiles
- describe distributions