

2022 EXAM COUNTDOWN LEVEL 1 PĀNGARAU

Before you start your exam preparation read through the following documents:

[How to study for a maths exam](#)

[2022 Assessment Specifications](#)

This Countdown provides a programme of revision for the following three NCEA Level 1 Maths/Pāngarau Achievement Standards:

- 91031: 1.6 Apply Geometric Reasoning In Solving Problems
- 91037: 1.12 Chance and Data
- 91028: 1.3 Investigate Relationships Between Tables Equations and Graphs

For each of these Achievement Standards, the Countdown outlines a 3 week programme of revision.

EXAMINATION DATE: NCEA LEVEL 1 MATHEMATICS AND STATISTICS, 10 NOVEMBER 2022

1.6 APPLY GEOMETRIC REASONING IN SOLVING PROBLEMS (91031)

Achievement Criteria

Ensure you and your students are familiar with the descriptions of:

[AS 91031 Achievement Standard 2019](#)

Key Tips

<https://studyt.govt.nz/Maths/level/4/standard/1.6>

Advise and Key Tips:

- Attempt all questions.
- Pythagoras' theorem and trigonometric ratios are included in this standard.
- Learn to name angles correctly eg $\angle ABC$.
- Do not assume information that is not supplied in a diagram.
- Geometric reasons must be in words, not diagrams.
- Appropriate abbreviations are acceptable for reasons.
- Learn geometric reasons . Use the correct words or abbreviations. You will find a list of these in your textbook or revision book.
- Check that your calculator is in "degree" mode at the start of the exam.
- Round angle measurements to 1 decimal place unless told otherwise, for example, 'The angle is 56.7° (1dp).'
- For Achievement with Merit and Achievement with Excellence, you must have a geometric reason for every step.
- Provide reasons for all questions in this achievement standard. Although reasons may not be asked for in the Achievement questions, they may be used as evidence for the Achievement with Merit and Achievement with Excellence questions where reasons are required.
- Round lengths using significant figures, for example, 'The distance is 360 metres (2sf).'
- Check that your answer makes sense in the context of the question. If not, check your working and method.
- A scale drawing is not appropriate in this achievement standard.
- A bearing is an angle measured in a clockwise direction from North.
- Write bearings with only 3 digits (no decimals).

Resource

Gamma mathematics NCEA L1 David Barton

Barton, D 2010, *Gamma Mathematics*, Pearson New Zealand

- Angle properties for straight lines and polygons p235
- Applying proportional reasoning to similar shapes p257
- Pythagoras p264
- Trigonometry p275
- Angle Properties in circles p282

3 WEEK REVISION SCHEDULE

WEEK 1	Pythagorus	The Theorem of Pythagorus • The Theorem of Pythagorus • https://www.youtube.com/watch?v=WqhlG3Vakw8 Math Antics: The Pythagorean Theorem • Practice Examples pp265-270 NCEA L1 David Barton • A proof of the Theorem of Pythagorus Ngā tapatoru rite • Properties of Triangles p271 NCEA L1 David Barton
WEEK 1	Trigonometry	Trigonometric Ratios (Ngā Ōwehenga Pākoki) • https://www.youtube.com/watch?v=5tp74q4N8EY Maths Tutorial: SOH CAH TOA (trigonometric ratio's) • https://www.youtube.com/watch?v=VRz2d5vedsg Trigonometric ratios. • Practice Examples 276 -281 NCEA L1 David Barton
WEEK 2	Angle properties for Straight Lines and Polygons	Angle Properties for Straight Lines and Polygons • Angles on a straight Line • Angles in a triangle • Different Types of Triangle p239 NCEA L1 David Barton • Practice Examples Exercises pp239 -240 NCEA L1 David Barton • Parallel Lines pp241-246 NCEA L1 David Barton • Polygons pp247-253 NCEA L1 David Barton • Facts and Terms from Geometry p254 NCEA L1 David Barton • Quadrilaterals p255 NCEA L1 David Barton
WEEK 2	Applying Proportional reasoning to similar shapes	Applying Proportional reasoning to similar shapes • Practice Examples Exercises pp257-263 NCEA L1 David Barton
WEEK 3	Angle properties in circles	Angle properties in circles • Angle at the centre of a circle p285 NCEA L1 David Barton • Angles on the same arc p287 NCEA L1 David Barton • Cyclic Quadrilaterals p289 NCEA L1 David Barton • Concyclic points p291 NCEA L1 David Barton • Tangents to a circle p294 NCEA L1 David Barton • Angle Between a chord and a tangent p296 NCEA L1 David Barton • Facts and terms from geometry p299 NCEA L1 David Barton • Using Algebra in Geometry p299 NCEA L1 David Barton



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| | | <ul style="list-style-type: none">• Geometric Proof pp301-303 NCEA L1 David Barton |
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Practice Exam Papers

[Examination Paper 2021](#)

[Pepa Whakamātautau 2021](#)

[Examination Paper 2017](#)

[Pepa whakamātautau 2017](#)

[Exemplar answer script 2017 - Merit](#)

[Exemplar answer script 2017 - Achievement](#)

1.12 DEMONSTRATE UNDERSTANDING OF CHANCE AND DATA (AS91037)

Achievement Criteria

Ensure you and your students are familiar with the grade descriptions of:

[91037 Achievement Standard](#)

Key Tips

- You may be expected to complete probability trees and use these to find probabilities for any level of achievement.
- Multiply the probabilities along the branches of tree diagrams if you are asked for the probability that an event AND another event occur.
- Add the probabilities at the end of the branches if you are asked for the probability that an event OR another event occurs.
- Probabilities are best written as fractions but may be written as a decimal or percentage. If written as a percentage, you must include the percentage sign.
- Probability must **not** be written as a ratio.
- Be familiar with outcomes based on using dice, coins, and playing cards.
- Read questions carefully and check that you have answered what is asked.
- If you are asked to justify your reasons, a good way to answer clearly is to clearly bullet point your statements.
- Show all working as credit may be given for a minor slip, if the assessor can see what you have done.
- Attempt all questions as evidence from higher level questions may be used in awarding credit for a lower grade.
- Revise how to interpret measures of centre, measures of spread, and statistical graphs and tables.

Resource (Gamma mathematics NCEA L1 David Barton)

Barton, D 2010, *Gamma Mathematics*, Pearson New Zealand

- Statistical Measures and graphs p374
- Evaluating statistical reports and investigations p408
- Calculating probabilities p419

3 WEEK REVISION SCHEDULE

WEEK 1	Statistical measures and graphs (Resource David Barton Gamma Mathematics)	Statistical measures and graphs • Averages calculated from individual data P375 NCEA L1 David Barton • Grouped Data P378 NCEA L1 David Barton • Calculating and displaying spread P382 NCEA L1 David Barton • Statistical graphs P384 NCEA L1 David Barton • Comparing Data 392 NCEA L1 David Barton • Time Series P397 NCEA L1 David Barton • Applications of spreadsheets P403 NCEA L1 David Barton
WEEK 2	Evaluating statistical reports and investigations	Evaluating statistical reports and investigations • Statistical reports in the media P408 NCEA L1 David Barton • Statistical Graphs and investigations P414 NCEA L1 David Barton
WEEK 3	Calculating Probabilities	Calculating Probabilities • Equally likely outcomes P419 NCEA L1 David Barton • Equally likely outcomes example • Probability from tables P422 NCEA L1 David Barton • https://www.youtube.com/watch?v=KzfWUEljG18 Math Antics Basic Probability • Probability example • https://www.youtube.com/watch?v=O6obluO7FTQ • Tree Diagrams P427 NCEA L1 David Barton • Tree Diagram example • Expected number P432 NCEA L1 David Barton



Practice Exam Papers

[Examination Paper 2021](#)

[Pepa Whakamātautau 2021](#)

[Examination Paper 2017](#)

[Pepa whakamātautau 2017](#)

[Exemplar answer script 2017 – Merit](#)

[Exemplar answer script 2017 – Achievement](#)

[Examination Paper 2016](#)

1.3 INVESTIGATE RELATIONSHIPS BETWEEN TABLES, EQUATIONS AND GRAPHS (91028)

Achievement Criteria

Ensure you and your students are familiar with the grade descriptions of:

[AS91028: Achievement Standard](#)

Key Tips

<https://studyt.govt.nz/Maths/level/4/standard/1.3>

Advice and Key Tips:

- Graphs will involve only linear, quadratic and simple exponential functions.
- Features could include x and y intercepts, maxima and minima, axes of symmetry, domain and range, and gradients of straight lines (rates of change).
- An understanding of transformations of graphs is expected.
- You may be asked to write equations for data provided in a table of values or from a graph.
- You may be required to draw graphs, construct tables, or write equations for word problems.
- Use a ruler for drawing line graphs.
- Look carefully at the scales on each axis. When working out the gradient do not simply count squares – remember to check how many units each grid line represents first.
- Know the difference between 'intercept' and 'intersect'. An intercept is a point where the graph crosses the axes. Intersect means cross or meet.
- Parabolas should be smooth curves with a rounded turning point (vertex).
- Show your working clearly in correct mathematical steps. Give a full sentence stating your answer.
- Answer the question in the context that is given. Use common sense to check your answer.
- Reread the question to check that you have answered the question asked.
- A graph may be made up of two different functions (piecewise graph). It could be made up of two lines, or part of a parabola and a line.
- Attempt all questions as evidence from higher level questions may be used in awarding credit for a lower grade.



Resource (Gamma mathematics NCEA L1 David Barton)

Barton, D 2010, *Gamma Mathematics*, Pearson New Zealand

- Number and spatial patterns P133
- Linear graphs and rate of change P153
- Optimal Solutions P169
- Quadratic Exponential graphs P179

3 WEEK REVISION SCHEDULE

WEEK 1	Number and spatial patterns	Number and spatial patterns • Numerical substitution p133 NCEA L1 David Barton • Numerical substitution example • Linear patterns p139 NCEA L1 David Barton • https://www.youtube.com/watch?v=MXV65i9g1Xg • Math Antis basic Linear Functions • https://www.youtube.com/watch?v=l3XzepN03KQ • Solving Basic Equations Part One • https://www.youtube.com/watch?v=Qyd_v3DGzTM • Solving Basic Equations Part Two • https://www.youtube.com/watch?v=LDliYKYvvdA • Solving 2 step equations • https://www.youtube.com/watch?v=52tpYl2tTqk • Math Antics What are functions? • https://www.youtube.com/watch?v=9Uc62CuQjc4 • Graphing on the co-ordinate Plane. • Linear patterns example • Quadratic patterns p143 NCEA L1 David Barton • Quadratic patterns example • Exponential patterns p148 NCEA L1 David Barton • Exponential example •
WEEK 2	Linear Graphs and rate of change	Linear Graph and rate of change • Mathematical formula for straight line graphs p153 NCEA L1 David Barton • Drawing straight lines from the equation p157 NCEA L1 David Barton • Drawing straight lines example • Simultaneous equations and straight lines p163 NCEA L1 David Barton • Simultaneous equations examples
WEEK 3	Optimal Solutions , Quadratic Exponential Graphs	Optimal Solutions, Quadratic Exponential Graphs • Optimal solutions one variable p170 NCEA L1 David Barton • Optimal solutions two variables p175 NCEA L1 David Barton • Parabolas p179 NCEA L1 David Barton • How to graph a parabola example • Exponential graphs p191 NCEA L1 David Barton • Exponential graph example

Practice Exam Papers

[Examination Paper 2021](#)



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[Pepa Whakamātautau 2021](#)

[Examination Paper 2018](#)

[Pepa whakamātautau 2018](#)

[Exemplar answer script 2018 – Excellence](#)

[Exemplar answer script 2018 – Merit](#)

[Exemplar answer script 2018 – Achievement](#)

[AS91655 Te whakaoti rangahau pāngarau](#)

[AS91656 Te whakaatu mōhiotanga ki te reo matatini o te pāngarau](#)