Pearson Edexcel Award in

Algebra

Pearson Edexcel Level 2 Award in Algebra (AAL20)
Pearson Edexcel Level 3 Award in Algebra (AAL30)
For first teaching October 2012
Issue 3

Algebra

Edexcel, BTEC and LCCI qualifications

Edexcel, BTEC and LCCI qualifications are awarded by Pearson, the UK's largest awarding body offering academic and vocational qualifications that are globally recognised and benchmarked. For further information, please visit our qualifications website at qualifications.pearson.com. Alternatively, you can get in touch with us using the details on our contact us page at qualifications.pearson.com/contactus

About Pearson

Pearson is the world's leading learning company, with 35,000 employees in more than 70 countries working to help people of all ages to make measurable progress in their lives through learning. We put the learner at the centre of everything we do, because wherever learning flourishes, so do people. Find out more about how we can help you and your learners at qualifications.pearson.com

This specification is Issue 3. Key changes are listed in summary table on next page. We will inform centres of any changes to this issue. The latest issue can be found on the Pearson website: qualifications.pearson.com

References to third-party material made in this specification are made in good faith. We do not endorse, approve or accept responsibility for the content of materials, which may be subject to change, or any opinions expressed therein. (Material may include textbooks, journals, magazines and other publications and websites.)

All information in this specification is correct at the time of publication.

Summary of Pearson Edexcel Awards in Algebra specification Issue 3 changes

Summary of changes made between previous issue and this current issue	Page/section number
Appendices 3-5 have been removed as the mappings to old qualifications are no longer relevant.	n/a
ExamZone information has been deleted as this is no longer relevant.	19

Earlier issues show previous changes.

If you need further information on these changes or what they mean, contact us via our website at: qualifications.pearson.com/en/support/contact-us.html.

Introduction

The Pearson Edexcel Level 2 and Level 3 Awards in Algebra are designed for use in schools and colleges. They are part of a suite of mathematics qualifications offered by Pearson.

Qualification objectives

The Pearson Edexcel Level 2 and Level 3 Awards in Algebra enable students to:

- develop a thorough knowledge and understanding of concepts in algebra and a sound foundation of mathematical techniques

- acquire confidence in their mathematical skills to move into further study in the subject or related areas

- enjoy using mathematics and become confident when using mathematics

- develop proficiency in algebra to support progression in their studies, in the workplace and for training.

The qualifications support progression to other level 2 and level 3 qualifications, such as GCSE and GCE. The awards indicate clear progression from level 2 and level 3.

Contents

Specification at a glance

These Level 2 and Level 3 Awards consist of a single assessment at each level.

- Students are entered at either Level 2 or Level 3.
- Each qualification is awarded as pass or unclassified.

Level 2	Paper code: AAL20
• Externally assessed • Availability: January and June series • First assessment: June 2013	**100% of the Award**
Overview of content • Algebraic manipulation and solution of equations • Inequalities and number sequences • Linear and curved graphs, distance and time graphs, speed and time graphs	
Overview of assessment • The award is assessed through a 1 hour and 30 minutes examination set and marked by Pearson. • The total number of marks for the paper is 80. • The qualification is awarded as pass or unclassified. • Calculators are **not** allowed.	

Level 3	Paper code: AAL30
• Externally assessed • Availability: January and June series • First assessment: June 2013	**100% of the Award**
Overview of content • Algebraic manipulation and solution of equations • Inequalities and number sequences • Linear and curved graphs, distance and time graphs, speed and time graphs	
Overview of assessment • The award is assessed through a 2 hour examination set and marked by Pearson. • The total number of marks for the paper is 90. • The qualification is awarded as pass or unclassified. • Calculators are **not** allowed	

External assessment

In all examination papers:

- diagrams will not necessarily be drawn to scale and measurements should not be taken from diagrams unless instructions to this effect are given

- each student may be required to use mathematical instruments, eg ruler.

Qualification content

Qualification framework

These qualifications comply with the requirements of the statutory regulation of qualifications in England, Wales and Northern Ireland which are prescribed by the regulatory authorities.

Knowledge, skills and understanding

The Pearson Edexcel Level 2 and Level 3 Awards in Algebra require students to demonstrate application and understanding of the following.

Level 2 content contains:

1 **Roles of symbols**

2 **Algebraic manipulation**

3 **Formulae**

4 **Linear equations**

5 **Graph sketching**

6 **Linear inequalities**

7 **Number sequences**

8 **Gradients of straight line graphs**

9 **Straight line graphs**

10 **Graphs for real life situations**

11 **Simple quadratic functions**

12 **Distance-time and speed-time graphs**

Knowledge, skills and understanding (continued)

Level 3 content contains:

1   Roles of symbols

2   Algebraic manipulation

3   Formulae

4   Simultaneous equations

5   Quadratic equations

6   Roots of a quadratic equation

7   Inequalities

8   Arithmetic series

9   Coordinate geometry

10 Graphs of functions

11 Graphs of simple loci

12 Distance-time and speed-time graphs

13 Direct and inverse proportion

14 Transformations of functions

15 Area under a curve

16 Surds

Assessment overview

- One written paper for each award is taken at the end of the course.
- The Level 2 award:
  - is assessed through a 1 hour and 30 minutes examination set and marked by Pearson.
  - Calculators are **not** allowed
  - The total number of marks for the paper is 80.
- The Level 3 award:
  - is assessed through a 2 hour examination set and marked by Pearson.
  - Calculators are **not** allowed
  - The total number of marks for the paper is 90.
- Each qualification is awarded at pass or unclassified.
- Available in January and June.
- First assessment: June 2013.

Pearson Edexcel Level 2 Award in Algebra

Overview

Content overview

This qualification contains:

1 **Roles of symbols**

2 **Algebraic manipulation**

3 **Formulae**

4 **Linear equations**

5 **Graph sketching**

6 **Linear inequalities**

7 **Number sequences**

8 **Gradients of straight line graphs**

9 **Straight line graphs**

10 **Graphs for real life situations**

11 **Simple quadratic functions**

12 **Distance-time and speed-time graphs**

Assessment overview

- One written paper for is taken at the end of the course.
- The Level 2 award:
  - is assessed through a 1 hour and 30 minutes examination set and marked by Pearson.
  - Calculators are **not** allowed
  - The total number of marks for the paper is 80.
- Each qualification is awarded at pass or unclassified.
- Available in January and June.
- First assessment: June 2013.
- Calculators are not allowed in the assessment.

Level 2

What students need to learn:

	Topic		Concepts and skills
1.	**Roles of symbols**	1.	Distinguish between the roles played by letter symbols in algebra using the correct notation
		2	Distinguish in meaning between the words equation, formula and expression
		3.	Write an expression to represent a situation in 'real life'
2.	**Algebraic manipulation**	1.	Collect like terms
		2.	Multiply a single term over a bracket
		3.	Factorise algebraic expressions by taking out all common factors
		4.	Use index laws for multiplication, division and raising a power to a power
3.	**Formulae**	1.	Substitute numbers into a formula
		2.	Change the subject of a formula where the subject only appears once
4.	**Linear equations**	1.	Solve linear equations with integer coefficients where the variable appears on either side or on both sides of the equation
		2.	Solve linear equations which include brackets, those that have negative signs occurring anywhere in the equation, those with negative and fractional solutions and those with fractional coefficients
5.	**Graph sketching**	1.	Sketch graphs of quadratic functions, considering orientation and labelling the point of intersection with the y-axis, considering what happens to y for large positive and negative values of x
6.	**Linear inequalities**	1.	Show inequalities on a number line, using solid circles to show inclusive inequalities and open circles to show exclusive inequalities
		2.	Write down an inequality shown on a number line
		3.	Solve simple linear inequalities in one variable

	Topic		Concepts and skills
7.	**Number sequences**	1.	Generate terms of a sequence using term-to-term definition or using position-to-term definition
		2.	Find and use the nth term of a linear arithmetic sequence
8.	**Gradients of straight line graphs**	1.	Find the gradient of a straight line graph
		2.	Interpret the gradient of real-life graphs
9.	**Straight line graphs**	1.	Recognise, plot and draw graphs of the form $y = mx + c$
		2.	Given a straight line graph, find its equation
10	**Graphs for real-life situations**	1.	Understand that straight and curved graphs can represent real-life situations
		2.	Draw, and interpret information from graphs of real-life situations
11	**Simple quadratic functions**	1.	Plot graphs of simple quadratic functions
		2	Find approximate solutions of a quadratic equation from the graph of the corresponding quadratic function
12	**Distance-time and speed-time graphs**	1.	Draw distance-time graphs and speed-time graphs
		2.	Interpret distance-time graphs and speed-time graphs
		3	Understand that the gradient of a distance-time graph represents speed
		4.	Find speed and distance from information on a travel graph

Pearson Edexcel Level 3 Award in Algebra

Overview

Content overview

This qualification contains:

1. Roles of symbols
2. Algebraic manipulation
3. Formulae
4. Simultaneous equations
5. Quadratic equations
6. Roots of a quadratic equation
7. Inequalities
8. Arithmetic series
9. Coordinate geometry
10. Graphs of functions
11. Graphs of simple loci
12. Distance-time and speed-time graphs
13. Direct and inverse proportion
14. Transformations of functions
15. Area under a curve
16. Surds

Assessment overview

- One written paper is taken at the end of the course.
- The Level 3 award:
  - is assessed through a 2 hour examination set and marked by Pearson.
  - Calculators are **not** allowed
  - The total number of marks for the paper is 90.
- Each qualification is awarded at pass or unclassified.
- Available in January and June.
- First assessment: June 2013
- Calculators are not allowed in the assessment.

The content of the Level 2 Award in Algebra is assumed knowledge and this content may be assessed in the Level 3 award.

Level 3

What students need to learn:

The content of the Level 2 Award in Algebra is assumed knowledge and this content may be assessed in the Level 3 award.

	Topic		Concepts and skills
1.	**Roles of symbols**	1.	Distinguish between the roles played by letter symbols in algebra using the correct notation, and between the words equation, formula identity and expression
2.	**Algebraic manipulation**	1.	Multiply two linear expressions
		2.	Factorise expressions including quadratics and the difference of two squares, taking out all common factors
		3.	Use index laws to include fractional and negative indices
		4.	Simplify algebraic fractions
		5.	Complete the square in a quadratic expression
3.	**Formulae**	1.	Substitute numbers into formulae
		2.	Change the subject of a formula
4.	**Simultaneous equations**	1.	Solve simultaneous equations in two unknowns, where one may be quadratic, where one may include powers up to 2
5.	**Quadratic equations**	1.	Solve quadratic equations by factorisation or by using the formula or by completing the square
		2.	Know and use the quadratic formula
6.	**Roots of a quadratic equation**	1.	Understand the role of the discriminant in quadratic equations
		2.	Understand the sum and the product of the roots of a quadratic equation

	Topic	Concepts and skills
7.	**Inequalities**	1. Solve linear inequalities, and quadratic inequalities
		2. Represent linear inequalities in two variables on a graph
8.	**Arithmetic series**	1. Find and use the general term of arithmetic series
		2. Find and use sum of an arithmetic series
9.	**Coordinate geometry**	1. Forms of the equation of a straight line graph
		2. Conditions for straight lines to be parallel or perpendicular to each other
10.	**Graphs of functions**	1. Recognise, draw and sketch graphs of linear, quadratic, cubic, reciprocal, exponential and circular functions, and understand tangents and normals
		2. Sketch graphs of quadratic, cubic, and reciprocal functions, considering asymptotes, orientation and labelling points of intersection with axes and turning points
		3. Use graphs to solve equations
11.	**Graphs of simple loci**	1. Construct the graphs of simple loci eg circles and parabolas
12.	**Distance-time and speed-time graphs**	1. Draw and interpret distance-time graphs and speed-time graphs
		2. Understand that the gradient of a distance-time graph represents speed and that the gradient of a speed-time graph represents acceleration
		3. Understand that the area under the graph of a speed-time graph represents distance travelled
13.	**Direct and inverse proportion**	1. Set up and use equations to solve word and other problems using direct and inverse proportion and relate algebraic solutions to graphical representations of the equations
14.	**Transformations of functions**	1. Apply to the graph of $y = f(x)$ transformations of $y = f(x) \pm a$, $y = f(\pm ax)$, $y = f(x \pm a)$, $y = \pm af(x)$ for any function in x

	Topic	Concepts and skills
15.	**Area under a curve**	1. Find the area under a curve using the trapezium rule
16.	**Surds**	1. Use and manipulate surds, including rationalising the denominator of a fraction written in the form $\dfrac{a}{b \pm \sqrt{c}}$

Assessment

Assessment summary

Level 2
Paper code: AAL20
• One written paper. • The paper is assessed through a 1 hour and 30 minute examination, set and marked by Pearson. • The total number of marks for the paper is 80. • Calculators are **not** allowed • The qualification is awarded at pass or unclassified.

Level 3
Paper code: AAL30
• One written paper. • The paper is assessed through a 2 hour examination, set and marked by Pearson. • The total number of marks for the paper is 90. • Calculators are **not** allowed. • The qualification is awarded at pass or unclassified.

Assessment objectives and weightings

Level 2

		% in Award
AO1:	demonstrate knowledge, understanding and skills in algebraic symbols and manipulation	25%-35%
AO2:	demonstrate knowledge, understanding and skills in solving equations and inequalities and using substitution	35%-45%
AO3:	demonstrate knowledge, understanding and skills in interpreting, drawing and sketching graphs and using graphs to solve equations	25%-35%
	TOTAL	100%

Level 3

		% in Award
AO1:	demonstrate knowledge, understanding and skills in algebraic symbols and manipulation	25%-35%
AO2:	demonstrate knowledge, understanding and skills in solving equations, and inequalities and using substitution	25%-35%
AO3:	demonstrate knowledge, understanding and skills in interpreting, drawing and sketching graphs and using graphs to solve equations	35%-45%
	TOTAL	100%

Relationship of assessment objectives to papers

Paper number	Assessment objective			
	AO1	**AO2**	**AO3**	**Total for AO1, AO2 and AO3**
Level 2	25%-35%	35%-45%	25%-35%	100%
Level 3	25%-35%	25%-35%	35%-45%	100%

Entering your students for assessment

Student entry

Students are entered at either Level 2 or Level 3.

Details of how to enter students for These qualifications can be found in Pearson's *Information Manual*, copies of which (in CD format) are sent to all active Pearson centres. The information can also be found on Pearson's website: qualifications.pearson.com

Access arrangements and special considerations

Pearson's policy on access arrangements and special considerations for GCE, GCSE, International GCSE, and Entry Level qualifications aims to enhance access to the qualifications for students with disabilities and other difficulties without compromising the assessment of skills, knowledge, understanding or competence.

The access arrangements and special arrangements for these qualification will comply with this policy.

Please see the Pearson website (qualifications.pearson.com) for:

- the Joint Council for Qualifications (JCQ) policy Access Arrangements, Reasonable Adjustments and Special Considerations 2010-2011
- the forms to submit for requests for access arrangements and special considerations
- dates for submission of the forms.

Requests for access arrangements and special considerations must be addressed to:

Special Requirements
Pearson
One90 High Holborn
London WC1V 7BH

Assessing your students

The first assessment opportunity for these qualifications will take place in the June 2013 series and in each January and June series thereafter for the lifetime of the qualifications.

Your students' assessment opportunities

All papers	June 2013	January 2014	June 2014	January 2015
Level 2 and Level 3	✓	✓	✓	✓

Awarding and reporting

The awarding and certification processes for these qualifications will comply with the current GCSE/GCE Code of Practice, which is published by the Office of Qualifications and Examinations Regulation (Ofqual). The Level 2 and Level 3 Awards qualifications will be pass only.

The first certification opportunity for the Pearson Edexcel Level 2 and Level 3 Awards in Algebra will be June 2013.

Students whose level of achievement is below the minimum judged by Pearson to be of sufficient standard to be recorded on a certificate will receive an unclassified (U) result.

Language of assessment

Assessment of These qualifications will be available in English only. Assessment materials will be published in English only and all work submitted for examination must be produced in English.

Malpractice and plagiarism

For up-to-date advice on malpractice and plagiarism, please refer to the JCQ's *Suspected Malpractice in Examinations and Assessments: Policies and Procedures* document on the JCQ website: www.jcq.org.uk.

Student recruitment

Pearson's access policy concerning recruitment to our qualifications is that:

- they must be available to anyone who is capable of reaching the required standard

- they must be free from barriers that restrict access and progression

- equal opportunities exist for all students.

Prior learning

For level 2, this qualification builds on the content, knowledge and skills developed in the Key Stage 3 Programme of Study for Mathematics as defined by the National Curriculum Orders for England.

For level 3, this qualification builds on the content, knowledge and skills taught as part of GCSE mathematics.

Total Qualification Time and Guided Learning Hours

For all regulated qualifications, we specify a total number of hours that learners are expected to undertake in order to complete and show achievement for the qualification – this is the Total Qualification Time (TQT). The TQT value indicates the size of a qualification.

Within the TQT, we identify the number of Guided Learning Hours (GLH) that a centre delivering the qualification needs to provide. Guided learning means activities that directly or immediately involve tutors and assessors in teaching, supervising, and invigilating learners, for example lectures, tutorials, online instruction and supervised study.

As well as guided learning, there may be other required learning that is directed by tutors or assessors. This includes, for example, private study, preparation for assessment and undertaking assessment when not under supervision, such as preparatory reading, revision and independent research.

TQT and guided learning hours are assigned after consultation with users of the qualifications.

This qualification has a TQT value of 80 and a GLH of 60.

Progression

At level 2, this qualification supports progression to:

- GCSE (9-1) in Mathematics

- International GCSEs in Mathematics

- Level 1/Level 2 Certificate in Mathematics

- GCE AS Level Mathematics

- further level 2 qualifications in other subjects, such as chemistry, biology, psychology and electronics

- further education or employment where mathematical skills are required.

At level 3, this qualification supports progression to:

- GCE AS and A Level Mathematics

- further level 2 and level 3 qualifications in other subjects, such as biology, chemistry, psychology and electronics

- undergraduate degrees in numerate disciplines, such as the biosciences

- further education or employment where mathematical skills are required.

Level descriptors

The following level descriptions indicate the level of attainment characteristic of the given level. They give a general indication of the required learning outcomes at each specified level. The descriptors should be interpreted in relation to the content outlined in the specification; they are not designed to define that content. The level awarded will depend in practice upon the extent to which the candidate has met the Assessment Objectives overall. Shortcomings in some aspects of the examination may be balanced by better performance in others.

Level 2

Candidates find and describe in symbols the next term or the nth term of a sequence, where the rule is linear. They multiply two expressions of the form $(x + n)$ and they simplify the corresponding quadratic expressions. They represent inequalities using a number line. They formulate and solve linear equations with whole number coefficients. They manipulate simple algebraic formulae, equations and expressions. They use trial and improvement to solve cubic equations. They factorise simple expressions. Candidates sketch quadratic graphs and label them correctly. Candidates draw linear and quadratic graphs. They understand the role of m and c in $y = mx + c$. They interpret distance-time graphs from real-life situations.

Level 3

Candidates understand and use direct and inverse proportion. They manipulate algebraic formulae, equations and expressions, finding common factors and multiplying two linear expressions. In simplifying algebraic expressions, they use rules of indices for negative and fractional values. In finding formulae that approximately connect data, candidates express general laws in symbolic form. Candidates solve quadratic equations and understand the role of a, b and c in $ax^2 + bx + c = 0$. They draw and sketch a range of functions and understand tangents and normals. They manipulate and use surds.

Support and training

Pearson support services

Pearson has a wide range of support services to help you implement this qualification successfully.

ResultsPlus – ResultsPlus is an application launched by Pearson to help subject teachers, senior management teams, and students by providing detailed analysis of examination performance. Reports that compare performance between subjects, classes, your centre and similar centres can be generated in 'one-click'. Skills maps that show performance according to the specification topic being tested are available for some subjects. For further information about which subjects will be analysed through ResultsPlus, and for information on how to access and use the service, please visit our website.

Ask the Expert – To make it easier for you to raise a query with us online, we have merged our **Ask Edexcel** and **Ask the Expert** services.

There is now one easy-to-use web query form that will allow you to ask any question about the delivery or teaching of Pearson Edexcel qualifications. You'll get a personal response, from one of our administrative or teaching experts, sent to the email address you provide.

We'll also be doing lots of work to improve the quantity and quality of information in our FAQ database, so you'll be able find answers to many questions you might have by searching before you submit the question to us.

Training

A programme of professional development and training courses, covering various aspects of the specification and examination, will be arranged by Pearson Edexcel. Full details can be obtained from our website: qualifications.pearson.com

Appendices

Appendices

Appendix 1: Wider curriculum

Signposting and development suggestions

Issue	Paper	Opportunities for development
Spiritual	All papers	These qualifications will enable centres to provide courses in mathematics that will allow students to discriminate between truth and falsehood. As candidates explore mathematical models of the real world there will be many naturally arising moral and cultural issues, environmental and health and safety considerations and aspects of European developments for discussion, for example:
Moral	All papers	
Ethical	All papers	
Social	All papers	
Legislative	All papers	
Economic	All papers	
Cultural	All papers	
Sustainable	All papers	• use and abuse of statistics in the media
Health and safety	All papers	• financial and business mathematics
European initiatives	All papers	• how mathematics is used to communicate climate change • cultural and historical roots of mathematics • use of mathematics in cultural symbols and patterns.

Appendix 2: Codes

Type of code	Use of code	Code number
Qualification codes	Each qualification title is allocated a national framework code. The national framework code is known as a Qualification (QN). This is the code that features in the DfE Funding Schedule, Section 96, and is to be used for all qualification funding purposes. The QN is the number that will appear on the student's final certification documentation.	The QN for the qualifications in this publication are: Level 2: 600/6631/3 Level 3: 600/6632/5
Cash-in codes	The cash-in code is used as an entry code to aggregate the student's scores to obtain the overall grade for the qualification. Centres will need to use the entry codes only when entering students for their qualification.	Level 2: AAL20 Level 3: AAL30
Entry codes	The entry codes are used to: • enter a student for assessment • aggregate the student's paper scores to obtain the overall grade for the qualification.	Please refer to the *Information Manual*, available on the Pearson website.