# OCR - Oxford Cambridge and RSAAn analysis of the differences between Specification A and Specification B

## Please note that most of the differences identified are differences in exemplification, not differences in content. (Unshaded content is AS content.)

| **DfE Reference** | **MEI Reference** | **OCR Reference** | **Notes** |
| --- | --- | --- | --- |
| - | \* | - | *Spec B includes a number of asterisked content statements which include GCSE content or prior knowledge.* |
| **PURE MATHEMATICS: PROOF (1)** | | | |
| MA1 | Mp1 | 1.01b | Spec A explicitly includes the use of logical connectives  and the associated language: *“congruence”, “if.....then” and “if and only if” (or “iff”)*, whereas this is implied in Spec B. |
| MA1 | Mp2 | 1.01c | Spec A explicitly includes the form of the statement for disproof by counter example (*“if P*(*x*) *is true then Q*(*x*) *is true”*) and the terms *“integer”, “real”, “rational”* and *“irrational”*. (This is exemplification not extra content.) |

| **DfE Reference** | **MEI Reference** | **OCR Reference** | **Notes** |
| --- | --- | --- | --- |
| **PURE MATHEMATICS: ALGEBRA (1)** | | | |
| OT1.1 & OT1.2 | Ma1 | - | Spec B includes knowing and being able to use vocabulary and notation appropriate to the subject at this level as one of its content statements. This is implied throughout Spec A. |
| MB5 | Ma7 & Ma8 | 1.02i | Spec B includes graphical treatment of solution of quadratic inequalities i.e. stating which regions are included and whether the boundaries are included. |
| MB5 | Ma9 | 1.02h | Spec A includes familiarity is expected with interval notation. |
| MB7 | Ma14 | 1.02r | Spec A explicitly includes relating different proportional relationships to linear, reciprocal or other graphs of variation. |
| **PURE MATHEMATICS: FUNCTIONS (1)** | | | |
| MB6 | Mf1 & Mf2 | 1.02j | Spec A includes simple algebraic division but this is implied in Spec B which includes being able to add, subtract, multiply and divide polynomials. |
| MB6 | Mf1 & Mf2 | 1.02j | Spec A explicitly includes familiarity with the terms *“quadratic”, “cubic”* and *“parabola”*. |
| **PURE MATHEMATICS: FUNCTIONS (2)** | | | |
| MB8 | Mf4 | 1.02v | Spec B explicitly includes finding the correct domain of gf given the domains of f and g. (This is exemplification not extra content.) |
| MB8 | Mf5 | 1.02v | Spec B explicitly includes finding domain and range of an inverse function. (This is exemplification not extra content.) |
| MB7 | Mf7 | 1.02t | Spec A includes solving graphically simple equations and inequalities involving the modulus function whereas Spec B is just solve simple inequalities containing a modulus sign. |
| **PURE MATHEMATICS: GRAPHS (1)** | | | |
| MB7 | MC4 | 1.02n | Spec A explicitly defines the extent to sketching polynomial equations i.e. degree . (This is exemplification not extra content.) |
| MB7 | MC5 | 1.02n | Spec B explicitly includes using stationary points when curve sketching whereas in Spec A sketches may require the determination of stationary points and, where applicable, distinguishing between them. |
| MB9 | MC7 | 1.02w | Spec A explicitly includes translations may be specified by a two-dimensional column vector. (This is only included against combined transformations for A level in Spec B - MC8.)  Spec B explicitly includes working with sketches of graphs where functions are not defined algebraically. (This is exemplification not extra content.) |
| **PURE MATHEMATICS: GRAPHS (2)** | | | |
| MB9 | MC8 | 1.02x | Spec B includes vector notation may be used for a translation (this was not included for the AS content in MC7). |
| - | MC9 | - | Spec B explicitly includes using stationary points of inflection when curve sketching. |

| **DfE Reference** | **MEI Reference** | **OCR Reference** | **Notes** |
| --- | --- | --- | --- |
| **PURE MATHEMATICS: COORDINATE GEOMETRY (1)** | | | |
| MB7 | Mg8, MC2 & Ma6 | 1.02q | Spec A explicitly includes intersection points may be between two curves one or more of which may be polynomial, trigonometric, exponential or a reciprocal graph whereas Spec B only includes finding the point(s) of intersection of a line and a curve or of two curves. |
| **PURE MATHEMATICS: COORDINATE GEOMETRY (2)** | | | |
| MC3 | Mg12 & Mg13 | 1.03g | Spec A explicitly includes sketching simple parametric equations. |
| MC3 | Mg13 | 1.03g | Spec B includes being given guidance as to the choice of parameter. (This is exemplification not extra content.) |
| MC3 | Mg14 | (1.03g) | Spec B explicitly includes understanding and using the equation of a circle written in parametric form. |
| MG5 | Mg15 | 1.07s | Spec A includes differentiation of functions defined in terms of a parameter using the chain rule. |
| **PURE MATHEMATICS: SEQUENCES AND SERIES (1)** | | | |
| MD1 | Ms1 & Ms2 | 1.04a | Spec A explicitly includes being able to calculate binomial coefficients and knowing the relationship of the binomial coefficients to Pascal's triangle. This is implied in Spec B. |
| **PURE MATHEMATICS: TRIGONOMETRY (1)** | | | |
| ME3 | Mt2 | 1.05f | Spec B explicitly includes transformations (stretches, translations and reflections) of the graphs of the sine, cosine and tangent functions and combinations of these transformations. |
| ME1 | Mt4 | 1.05b | Spec A may include questions that require the use of the ambiguous case of the sine rule. This is not included in Spec B. |
| **PURE MATHEMATICS: EXPONENTIALS AND LOGARITHMS (1)** | | | |
| MF3 | ME3 | 1.06c | Spec B explicitly includes finding and interpreting asymptotes. |
| MF7 | ME11 | 1.06i | Spec B explicitly includes finding long term values. |
| **PURE MATHEMATICS: CALCULUS (1)** | | | |
| MG1 | Mc3 | 1.07b | Spec B explicitly includes being able to deduce the units of rate of change for graphs modelling real situations. |
| MG1 | Mc5 & Mc3 | 1.07g | Spec A indicates that integer powers greater than 4 are excluded. |
| **PURE MATHEMATICS: CALCULUS (2)** | | | |
| MG1 | Mc17 | 1.07f | Spec B includes slightly different terminology, i.e. concave upwards (convex downwards) and concave downwards (convex upwards). |
| MG3 | Mc18 | 1.07p | Spec B includes distinguishing between maxima, minima and stationary points of inflection. |
| **PURE MATHEMATICS: CALCULUS (2)** | | | |
| MH2 | Mc24 | 1.08c | Spec A states that integrals of *, and*  will be given if required whereas Spec B excludes integrals involving inverse trigonometrical functions. |
| MH3 | Mc26 | 1.08f | Spec A includes using integration to find the area of a region bounded by a curve and lines parallel to the coordinate axes, or between two curves or between a line and a curve whereas Spec B only includes finding the area between two curves and being able to find the area between a curve and the *y*-axis. |
| **PURE MATHEMATICS: NUMERICAL METHODS (2)** | | | |
| MI1 | Me1 | 1.09a | Spec A includes verifying the level of accuracy of an approximation by considering upper and lower bounds. (This is exemplification not extra content.) |
| MI2 | Me4 | 1.09d | Spec B includes representing the process on a graph. |
| MI2 | Me5 | 1.09e | Spec B includes showing this graphically. |
| **PURE MATHEMATICS: VECTORS (1)** | | | |
| MJ4 | Mv4 | 1.10e | Spec A explicitly includes understanding the meaning of displacement vector, component vector, resultant vector, parallel vector, equal vector and unit vector. |
| **PURE MATHEMATICS: VECTORS (2)** | | | |
| MJ5 | Mv7 | 1.10h | Spec A explicitly includes equations of uniform acceleration may be used in vector form to find an unknown. (This is exemplification not extra content.) |

| **DfE Reference** | **MEI Reference** | **OCR Reference** | **Notes** |
| --- | --- | --- | --- |
| - | \* | - | *Spec B includes a number of asterisked content statements which include GCSE content or prior knowledge.* |
| **STATISTICS: SAMPLING (1)** | | | |
| MK1 | Mp24 | 2.01d | Spec B includes: Understand and be able to use systematic sampling, stratified sampling, quota sampling, cluster sampling and self-selected samples.  Spec A includes: Learners should be familiar with (and be able to critique in context) the following sampling methods, but will not be required to carry them out: systematic, stratified, cluster and quota sampling. |
| **STATISTICS: DATA PRESENTATION AND INTERPRETATION (1)** | | | |
| ML1 | MD1 | 2.02a & 2.02b | Spec B explicitly includes: Be able to recognise and work with categorical, discrete, continuous and ranked data; interpret standard diagrams for grouped and ungrouped single-variable data. Pie chart and frequency chart are listed in the notes of Spec B but not Spec A.  Spec B states that learners may be asked to add to any of the types of diagrams listed in the examinations in order to interpret data.  Spec A explicitly includes understanding the advantages and disadvantages of different statistical diagrams. |
| ML1 | MD4 | 2.02a | Spec B also includes being able to describe frequency distributions (symmetrical, unimodal, bimodal, skewed (positively and negatively)). |
| ML1 | MD5 | 2.02b | Spec B explicitly includes understanding that diagrams representing unbiased samples become more representative of theoretical probability distributions. |
| ML2 | MD6 | 2.02c | Spec B explicitly includes 'other best fit models' such as a curve produced by software, interpolation and extrapolation and the term association. |

|  |  |  |  |
| --- | --- | --- | --- |
| **DfE Reference** | **MEI Reference** | **OCR Reference** | **Notes** |
| ML4 | MD9 | 2.02i | Spec B explicitly includes graphs for time series. |
| ML3 | MD10 & MD11 | 2.02f | Spec A includes using the mean and standard deviation to compare distributions.  Spec B includes deciding when it is most appropriate to use the standard measures of central tendency and also when to use a weighted mean. |
| ML3 | MD12 | 2.02g | Notation and formulae for variance and standard deviation is different for Spec A and B. The divisor is *n* - 1 in Spec B and *n* in Spec A. |
| ML4 | MD13 & MD7 | 2.02h | Spec B explicitly includes being able to recognise and comment on outliers in a scatter diagram (MD7) in addition to generally understanding the term outlier and being able to identify an outlier (MD13). |
| **STATISTICS: PROBABILITY (2)** | | | |
| MM2 | Mu7 | 2.03d | Spec B explicitly includes conditional probability for independent events. |
| **STATISTICS: PROBABILITY DISTRIBUTIONS (1)** | | | |
| MN2 | MR4 | 2.04d | Spec B only includes mean . |
| **STATISTICS: PROBABILITY DISTRIBUTIONS (2)** | | | |
| MN2 | MR8 | 2.04e | Spec A does not refer to understanding how and why a continuity correction is used but it is implied. |
| MN2 | MR8, MR13 & (MR1) | 2.04h | Spec A includes being able to select an appropriate probability distribution for a context, this is implied in Spec B in MR1, MR8 and MR13. |

|  |  |  |  |
| --- | --- | --- | --- |
| **DfE Reference** | **MEI Reference** | **OCR Reference** | **Notes** |
| MN2 | MR9 & MR11 | 2.04g & 2.04h | Spec A explicitly includes four facts about what proportions of values lie within specified ranges in a Normal distribution and the location of the points of inflection in a Normal curve whereas Spec B only includes knowing the shape of the Normal curve with respect to the line of symmetry and the points of inflection.  Spec B explicitly includes knowing the shape of the Normal curve, both to recognise from the shape of the distribution when a binomial distribution can be approximated by a Normal distribution (Spec A only refers to large *n*) and understanding that histograms from increasingly large samples from a Normal distribution tend to the Normal curve. |
| **STATISTICS: STATISTICAL HYPOTHESIS TESTING (2)** | | | |
| MO2 | MH8 & MH9 | 2.05e | Spec B explicitly defines the situations where a hypothesis test for a single mean using the Normal distribution will be carried out; where a) the population variance is known, or b) the population variance is unknown but the sample size is large. This is implied in Spec A.  Spec B explicitly includes being able to identify the critical and acceptance regions. This is implied in Spec A. |
| MO3 | MH10 | 2.05f | Spec B includes understanding that a rank correlation coefficient measures the correlation between the data ranks rather than actual data values whereas Spec A does not refer to rank correlation. |
| MO1 | MH11 | 2.05g | Spec B includes being able to use a given correlation coefficient for a sample to make an inference about correlation or association in the population for given *p*-value or critical value. Spec A only includes using and being able to interpret Pearson's product-moment correlation coefficient in hypothesis tests and 'association' is not explicitly stated. |

| **DfE Reference** | | **OCR Reference** | **MEI Reference** | **Notes** |
| --- | --- | --- | --- | --- |
| **MECHANICS: MODELS AND QUANTITIES (1)** | | | | |
| MQ1 | | Mp31 | - | Spec B explicitly includes knowing the language used to describe simplifying assumptions in mechanics. This is implied in Spec A. |
| MQ1 | | Mp32 | - | Spec B explicitly includes understand and use the particle model. This is implied in Spec A. |
| **MECHANICS: KINEMATICS IN 1 DIMENSION (1)** | | | | |
| MQ1 | Mk1, Mk2, Mk3 & Mk9 | | 3.02a | Some differences in the language of kinematics included in the Specs; Spec B includes the terms magnitude of acceleration, relative velocity and displacement distance whereas Spec A includes equation of motion  Spec B has understanding the language of kinematics for both stage 1 and stage 2. |
| MQ4 | Mk5 & Mk6 | | 3.02f | Notation in Spec A and Spec B are different; Spec A uses *s* and Spec B uses *r*. |
| MQ3 | Mk7 | | 3.02d | Spec A includes exemplification of techniques to derive the constant acceleration formulae. (This is exemplification not extra content.) |
| **MECHANICS: KINEMATICS IN 2 DIMENSIONS (2)** | | | | |
| MQ4 | Mk10 | | 3.02g | Notation in Spec A and Spec B are different; Spec A uses **x** and Spec B uses **r**. |

| **DfE Reference** | **MEI Reference** | **OCR Reference** | **Notes** |
| --- | --- | --- | --- |
| **MECHANICS: RIGID BODIES (2)** | | | |
| MS1 | MF16 | 3.04c | Spec A includes modelling with rectangular laminas, uniform rods and non-uniform rods only, with specified assumptions. Spec B allows for any body where the centre of mass is given, can be found using symmetry or from consideration of moments. |

**OCR Resources**: *the small print*OCR’s resources are provided to support the teaching of OCR specifications, but in no way constitute an endorsed teaching method that is required by the Board, and the decision to use them lies with the individual teacher. Whilst every effort is made to ensure the accuracy of the content, OCR cannot be held responsible for any errors or omissions within these resources.   
© OCR 2018 - This resource may be freely copied and distributed, as long as the OCR logo and this message remain intact and OCR is acknowledged as the originator of this work.

OCR acknowledges the use of the following content: n/a

Please get in touch if you want to discuss the accessibility of resources we offer to support delivery of our qualifications: [resources.feedback@ocr.org.uk](mailto:resources.feedback@ocr.org.uk)

We’d like to know your view on the resources we produce. By clicking on ‘[Like](mailto:resources.feedback@ocr.org.uk?subject=I%20liked%20the%20AS%20and%20A%20Level%20Mathematics%20B%20Guide%20to%20differences%20between%20Spec%20A%20and%20Spec%20B)’ or ‘[Dislike’](mailto:resources.feedback@ocr.org.uk?subject=I%20disliked%20the%20AS%20and%20A%20Level%20Mathematics%20B%20Guide%20to%20differences%20between%20Spec%20A%20and%20Spec%20B) you can help us to ensure that our resources work for you. When the email template pops up please add additional comments if you wish and then just click ‘Send’. Thank you.

If you do not currently offer this OCR qualification but would like to do so, please complete the Expression of Interest Form which can be found here: [www.ocr.org.uk/expression-of-interest](http://www.ocr.org.uk/expression-of-interest)