# 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** |
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| - | \* | - | *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.) |

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| **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. |

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| **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.) |

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| **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. |

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| 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. |

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| 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. |

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| **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 motionSpec 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**. |

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| **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. |

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