MATHEMATICS SL TZ2

Time zone variants of examination papers

To protect the integrity of the examinations, increasing use is being made of time zone variants of examination papers. By using variants of the same examination paper candidates in one part of the world will not always be taking the same examination paper as candidates in other parts of the world. A rigorous process is applied to ensure that the papers are comparable in terms of difficulty and syllabus coverage, and measures are taken to guarantee that the same grading standards are applied to candidates' scripts for the different versions of the examination papers. For the May 2015 examination session the IB has produced time zone variants of Mathematics SL papers.

Overall grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 16	17 - 34	35 - 46	47 - 57	58 - 69	70 - 80	81 - 100

Internal assessment

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 2	3 - 5	6 - 8	9 - 11	12 - 14	15 - 17	18 - 20

The range and suitability of the work submitted

As compared to the last session, there was a wider range of topics chosen but also a growing number of similar explorations, for example there appeared to be a growth in the number of real-life modelling tasks. There were some very interesting topics addressed, some of them clearly original to students and sparked by things in their own lives. However, once again there were still many candidates who attempted explorations on common topics such as the Fibonacci sequence, the golden ratio, the Monty Hall problem and the SIR model for epidemics, casino games, cryptography, graphing musical tones, and projectile motion. Many of these stood out as being formulaic and often poorly done; perhaps those topics just appeal to weaker students. The downside of some of these explorations, modelling topics in particular, is that technology does a lot of the "exploring" and candidates were not always able to really demonstrate their understanding. In addition, it was rare for students to find excellent things to expand upon. A number of historical explorations were also submitted, possibly from candidates whose strengths are in areas other than mathematics. Most of these simply echoed information taken from external sources, with little real understanding of mathematics demonstrated. Occasionally, students from some schools appear to all produce explorations of a particular genre, maybe advised by the teacher that certain explorations lend themselves to particular criteria better than others. Although this is not against any IB guidelines, it is intended that, by doing the exploration, students benefit from the mathematical activities undertaken and find them both stimulating and rewarding. On the other hand, schools should not expect or require their students to tackle new mathematics or mathematics beyond the SL curriculum since those that chose a topic above the level of the course often struggled to demonstrate understanding of the mathematics presented in their exploration. Finally, there were still some samples that were based on old portfolio tasks which would prevent the students from achieving the highest levels in certain criteria.

Candidate performance against each criterion

Criterion A

Most students were able to present organized work with a reasonable introduction, provide some sort of rationale, state an aim, make an attempt to explain steps and end with a conclusion. With some coherence, they were able to achieve level 2 here. More explanations, rather than fewer, to clarify the links between one section and the next, as well as showing all steps in their working will improve the coherence of the work. Students should always bear in mind that the target audience for their exploration is their peers. As such, few candidates managed to reach level 4 since their work often suffered from incomplete explanations or an exploration that fully satisfied the stated aim. Both “concise” and “complete” are elusive descriptors. For instance, page after page of repetitive calculations/data/graphs would hurt the conciseness and flow of the paper. In general, explorations that go beyond 18 pages will struggle to be concise.

While more students are including citations, far too many only had a bibliography and did not cite sources of ideas and especially images in the text where those things occurred. This is something that teachers should be aware of, and should require students to correct between the initial and final drafts of the paper.

Criterion B

Most students were able to select appropriate mathematical presentations and employed mostly appropriate notations and symbols for their work, leading to a level 2. Most tables had appropriate headings and most curves were labelled, but endless tables of poorly labelled data are not particularly helpful and do not communicate well. In addition, notation continues to be problematic. The equal sign was often used when the approximation was more appropriate. Use of calculator notation such as * and ^ remains an issue even though it is less than in previous sessions. Different variables were inconsistently used for the same situations. At times variables would change in case (upper or lower) or even in the symbol used, in the middle of calculations or explanations. A lack of clear definition of variables used was also evident. It should be stressed that multiple forms of representations should be attempted whenever applicable. The exposure to, and use of, technology in candidates' explorations varies considerably from one school to the next.

Criterion C

While the understanding of this criterion appears to have improved somewhat from last year and teachers seemed to be more aware that personal engagement requires more than simply stating how much they enjoyed the topic, there are still too many teachers who award levels 3 or 4 without much evidence in the paper itself of the personal engagement. The greatest issue here is that candidates and teachers alike seem to believe that personal interest can be equated with personal engagement. Candidates continue to find making an exploration their own and/or thinking independently one of the harder parts of this internal assessment. Teachers are advised to encourage students to say when something in the exploration was their own original idea to help make the personal engagement more apparent.

Criterion D

The majority of students made some effort on reflecting even though the reflections often consisted solely of repeating results or describing them in terms of the situation. Although some of these reflections were meaningful within the context of their tasks, it would be better if the students could focus on the methods developed, the mathematical process applied, or the implication of the models utilized since truly critical consideration of the implications or limitations was rare. Both students and teachers need to be aware that it is necessary for the student to reflect on the mathematics and what they have learned about it, not just on the real-world phenomenon that they found interesting enough to study. The weaker explorations usually had very little reflection in the body of their work and left the vast majority of their reflection for the conclusion.

Criterion E

The quality of mathematics and understanding varied widely. Most explorations included mathematics at the appropriate level but it was unusual for candidates to score the top marks, mostly due to a lack of demonstrated understanding of the topic. For instance, a number of candidates used complicated mathematics taken from another source which they had evidently not understood and did not properly explain, use or apply. Such work was basically reduced to substituting values into given formula and had little scope to show mathematical knowledge or understanding. Using only technology to find regression equations without showing any knowledge of how this is accomplished, or trying any type of analytical approach, remains an issue. In such cases, technology often did the work and then the candidate would comment on the superficial results. These are commonly modelling or statistical based explorations, involving linear regressions or Chi-Squared tests, in which the results were generated from technology with no calculations undertaken. Few would go the extra mile and even attempt to explain the how or why behind these results. Too many students restrict themselves to level 2 because they only use mathematics from the prior learning section of the syllabus, even when in other criteria they might score quite well. Teachers could be doing more here to advise candidates on what is required in order to demonstrate understanding. In general, the quantity of mathematics used is not the deciding factor as to the attainment level achieved, but rather the degree of understanding demonstrated by the candidate.

Despite these comments there were some candidates and schools that submitted excellent work which demonstrated very good understanding. They attempted areas of mathematics which were not covered or taught in class by learning the content and techniques on their own.

Recommendations for the teaching of future candidates

- Teachers' understanding of the assessment criteria tended to be correlated with the candidate's performance, and hence, they must familiarize themselves with the expectations of these criteria. This suggests that training opportunities and exposure to a variety of explorations are significant in helping teachers communicate a clearer understanding of what is expected of their students. This can be accomplished through IB teacher training or attention to subject reports and support documents on the Online Curriculum Centre (OCC). Too many times it appears that the mark was generated from some personal understanding of what the criterion represented, rather than a true interpretation of it.
- Teacher guidance is the key in helping candidates choose a focused topic that includes relevant mathematics and provides them with sufficient opportunities to achieve the highest levels across all criteria. It is recommended that candidates choose something they are interested in and are able to actually do than to choose a topic they do not really understand. Students should also be guided on how to select an exploration task that is personally meaningful, allows genuine exploration and provides opportunity to employ mathematics that is commensurate with the level of the course. Standard textbook problems and popular topics that are freely available in the public domain should be avoided. Such a list can be deduced from this and last year's subject reports. These topics generally do not offer much scope for genuine personal engagement and critical reflections.
- The candidates need to be trained to understand the criterion better. This would also mean that teachers need to communicate this to the students through the examples. Teachers should note that a sizable set of new graded examples are available on the OCC and students might be provided access to some of those to help them get an idea of the sort of papers that score well. This highlights the importance of spending reasonable time in introducing the exploration.
- Teachers need to further emphasize the importance of clear referencing and students

should be taught how to provide appropriate in-text citation in their work. A bibliography alone does not help the reader to know when and how the piece of resource had been used in the work. In general, the basic elements of good writing should be taught, including especially the proper way to cite external sources.

- Proper notation should be emphasized, and simple things like how to properly label a graph or present calculations and algebraic arguments should be taught and demonstrated. Many students would benefit from specific instruction in the use of some sort of free software for generating mathematical expressions.
- Personal interest is not, in itself, personal engagement. Candidates should be taught what it means to "explore", and how different situations can be treated in this way. Examples done in class can almost always be reconsidered in terms of "what if...” This would help candidates see how they might ask themselves the same question as they explore their topics.
- Reflection on results should include some consideration of their appropriateness to the situation, their implications (e.g. a model function grows to infinity - is this reasonable?) and their limitations (a probability is near 0 but can it truly be 0?).
- The sequencing of topics studied should be reviewed to allow candidates the greatest flexibility of choice as they prepare their explorations in the middle of the course. Topics such as statistics (including regression) and probability could be treated earlier, as well as function transformations. Trigonometric functions and triangle relationships make for another good topic. Vectors and calculus are generally not accessible topics for the exploration, especially if these have only been treated at an introductory level at the time that the exploration is assigned.

Further comments

- Technology must be seen as a tool for the exploration; not a driver of the exploration. For instance, in modelling tasks, students should be encouraged to show at least why a certain regression model is chosen and as much as possible provide an understanding of the algebraic development of the chosen model.
- Often mathematics was used that was not from the SL course. Applying the mathematics students have discovered or used should be emphasized. Teachers were often awarding high marks for work that was either copied from the internet with no real understanding shown by the candidate. Mathematics used from Higher Level does not guarantee the highest grade when no real understanding has been shown. Similarly, complicated mathematics used from some other source which is not understood should be discouraged. A good number of these would be explorations based on topics in Physics; there was always significant mathematics involved (which was readily found in a standard textbook) and thus very hard to be sure that the student really understood the derivations. In general, only the very best candidates are likely to be successful with a goal that requires learning a whole new area of mathematics.
- Teachers appear not to always rigorously check calculations. They overlook both obscure and obvious errors made by students or do not annotate these errors if they have been seen. It is obviously helpful in moderation if mathematical errors are highlighted.
- Some schools only submitted photocopies of the student work. This loses the colour that the original printouts apparently had and therefore has the potential to affect the

communication mark. It also tends to make things more difficult to read.

Paper one

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 17	18 - 35	36 - 48	49 - 57	58 - 67	68 - 76	77 - 90

General comments

On the whole, candidates seemed well-prepared for this paper, and it seemed that fewer questions were left blank than in previous sessions. The paper seemed accessible to most candidates, with stronger candidates able to earn very high marks without much difficulty.

The areas of the programme and examination which appeared difficult for the candidates

- Integration using substitution and/or inspection methods
- Recognizing the relationship between a function and its inverse
- Understanding of the concept of a fair game
- Recognizing the relationships between parallel vectors
- Understanding the components of a vector equation of a line, especially as it relates to motion
- Interpreting the relationship between a function, the graph of the derivative of the function, and the integral of the derivative

The areas of the programme and examination in which candidates appeared well prepared

- Simple probability and use of tree diagrams
- Working with quadratic functions
- Interpreting cumulative frequency curve
- Routine work with vectors, especially finding a vector between two given points and scalar product
- Completing the square in a quadratic function with a leading coefficient

The strengths and weaknesses of the candidates in the treatment of individual questions

Question 1: probability and tree diagrams

This question was very well done, with nearly all the candidates earning full marks. The occasional candidate lost a mark in part (c) due to arithmetic errors when multiplying fractions. A few candidates attempted to add the fractions rather than multiplying along the branches.

Question 2: trigonometric function

On the whole, candidates did very well on this question. However, there were a number of candidates who were confused by the relationship between the period of the function and the parameter b in the equation of the function. A common error was to write $b = \text{period}$.

Question 3: cumulative frequency and grouped data

Candidates performed very well on this question, and it was pleasing to note that the majority of them could easily make the connection between the cumulative frequency graph and the table of grouped data. There were a few candidates who erroneously tried to find the median by simply finding the mid-value on the $x-$axis, and wrote solutions such as $\frac{0+6}{2}=3$. Although this incorrect method gave the correct answer of 3, the clear use of this invalid method meant these candidates did not earn the two marks in part (a) of this question.

Question 4: derivative and integral of a function

For the most part, candidates were able to earn full marks in part (a) of this question using either the quotient rule or the product rule. However, there were a surprising number of candidates who substituted incorrectly into the quotient rule, despite this formula being given in the formula booklet. Quite a few also made algebraic errors after substituting correctly, the most common of which was $\frac{x\left(\frac{1}{x}\right)-\ln x(1)}{x^2}=\frac{-\ln x}{x^2}$.

Part (b) of this question proved to be quite challenging for most candidates. Although many candidates attempted to use a substitution method with $u=\ln x$, very few were able to carry this through to find the correct answer. There were also a number of candidates who expressed their answers using incorrect notation, writing $\frac{\ln x^2}{2}$, rather than $\frac{(\ln x)^2}{2}$.

Question 5: patterns in derivatives

The large majority of candidates had no trouble finding the first two derivatives of e^{-2x}. However, many candidates did not seem to understand the notation $f^{(3)}(x)$, which is given in the Mathematics SL guide, and assumed this meant for them to raise the function to the third power. This error prevented the candidates from recognizing the pattern for the first, second and third derivatives, and they could not find an expression for $f^{(n)}(x)$. There were also many candidates who did find all three derivatives correctly and who seemed to recognize the pattern, but who did not earn full marks in part (b) because their answers included -2^n, rather than the correct $(-2)^n$.

Question 6: derivative of a polynomial and inverse function

Many candidates easily found the derivative of the polynomial function and used this to find the correct value of b using $f'(0)=3$. In addition, candidates who recognized that $f^{-1}(7)=1$ means that $f(1)=7$ had no trouble easily finding the value of a. The majority of candidates, however, tried to find the inverse of the function by switching x and y and rearranging the equation, which led to a wide variety of algebraic errors, and kept most of them from finding the value of a.

Question 7: concept of a fair game

This question proved to be quite challenging for a large number of candidates. Many candidates, seemingly by rote, attempted to use the familiar $E(X)=0$, without thinking about what a fair game means in the context of this question, where the player has already paid $10 to play the game. For candidates who did interpret the idea of a fair game correctly, the calculations involved in finding the value of k were quite simple, though a few struggled to compute $\frac{10}{0.4}$ as 25. There were also a number of candidates who found the correct answer by considering the amount of money spent and gained in, for example, ten trials or in 100 trials. This type of intuitive method is valid, and candidates were able to earn full marks for this, providing they clearly communicated their working.

Question 8: quadratic function

A large number of candidates did very well on this question, and many earned full marks on all four parts of the question. For candidates who recognized the relationships between the graph of the function and the different forms of the equation, this was quite a simple question. In part (c), for example, candidates who realized that the vertex lies on the axis of symmetry were able to easily find the largest value of the function without spending time on other, more time consuming, methods such as completing the square or using the derivative to find the maximum. Similarly, in part (d), candidates who understood that h and k are the coordinates of the vertex answered the question easily, while candidates who tried to complete the square often were not successful due to algebraic errors.

Question 9: vectors

Nearly all candidates answered parts (a) and (b), which are routine vectors questions, correctly. Some candidates began to struggle when they got to part (c), which required them to understand the properties of parallel vectors. In part (d), many candidates were unable to find the correct speed of the particle, as they either found the magnitude of their position vector ***c***, or because they did not use the correct vector ***a***, which had been given in an earlier part of the question.

Question 10: calculus

As expected, this was the most challenging question on the paper for many candidates, although the number of candidates who gained only a few marks on the question was surprising. In parts (a) and (b), the majority of candidates did not know how to relate the information given in the graph of f' to questions about the graph of f. In part (b), many candidates answered that the graph of f had a minimum where $x = a$, perhaps because this was a local minimum on the graph of the derivative. It was pleasing to note, however, that the majority of candidates who correctly answered $x = d$ were also able to provide a complete justification of their answer. In part (c), many candidates did not consider the two areas of the region, or did not compensate for the fact that the area from $x = 0$ to $x = d$ lies below the $x-$ axis, giving a negative integral. In addition, many candidates did not know how to use, or did not consider using, the fundamental theorem of calculus, which is given in the SL guide as $\int_a^b g'(x)dx = g(b) - g(a)$.

Recommendations and guidance for the teaching of future candidates

Teachers and students need to be familiar with the current Mathematics SL guide, particularly with respect to the syllabus content and the notation list. Students should be reminded of the importance of using correct mathematical notation in their working and their answers. Students should also practice with questions that require them to perform arithmetic calculations without a calculator.

It is important that students understand the concepts behind the mathematics they are learning in class, rather than just knowing which formulas to use. We often see that students are comfortable with predictable, formulaic questions, but then get stuck on questions which require the concepts to be used in non-routine ways. An example of this is question 6, where many students swapped the x and y values and got tied up in unnecessary algebraic manipulations trying to find an inverse expression they did not need, instead of considering the relationship between a function and its inverse. Another example is question 10, which relied on applying and interpreting calculus concepts, rather than asking them to use "rules" to find derivatives and integrals of given functions.

Finally, students should always show their working in a neat and orderly manner, rather than writing random bits of work and computations all over the page. It should be clear what question or question part the working is for, and working should be shown at the place where it is used. Students should be reminded that correct answers with no working will not necessarily be awarded full marks.

Paper two

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 15	16 - 30	31 - 38	39 - 47	48 - 57	58 - 66	67 - 90

The areas of the programme and examination which appeared difficult for the candidates

- Curve sketching
- Discriminant of a quadratic function
- Areas between curves
- Normal distribution
- Binomial distribution
- Conditional probability
- Transformations of functions
- Geometry of complex shapes.

The areas of the programme and examination in which candidates appeared well prepared

- Triangle trigonometry
- Application of sine and cosine rules
- Scalar product, magnitude and angle between vectors
- Linear regression
- Binomial expansion
- Equations of tangents and normals

The strengths and weaknesses of the candidates in the treatment of individual questions

Question 1: rule of sines and area of a triangle

Most candidates found this question straightforward and accessible.

Most recognized the need for the sine rule in part (a) to solve the problem. Occasionally, the setup had an incorrect match of angle and side. Some used radians instead of degrees, thus losing a mark.

Part (b) was also well done by most of the candidates. Some right triangle trigonometry correct approaches were seen to find the area. A few candidates used the cosine rule or right angled trigonometry, which were less efficient methods and often wasted valuable time.

Question 2: angle between vectors

Many candidates performed well in this question. Some candidates were unfamiliar with the basis vector notation and wrongly substituted the ***i-j-k*** into the formulas. Others occasionally assumed that the magnitude could be negative.

Question 3: linear regression

Many answered this question completely correct, showing familiarity with the GDC operation for finding the equation of the line and coefficient. It was not uncommon to see a=5.05 and $b = -0.488$, which indicates incorrect use of the GDC lists to find the values.

Some candidates attempted an algebraic approach to finding the regression line and a few seemed to not recognize that *r* represents the coefficient of correlation.

Question 4: binomial expansion

Candidates who recognized that the third term is required usually completed the question successfully, although some candidates only gave a single value for *k*. A few candidates attempted to fully expand algebraically, which proved to be a fruitless enterprise.

Question 5: graph and transformation on an exponential function

Although this question involved a straightforward use of the GDC, the graphing of this exponential function on a given grid seemed challenging for a number of candidates. Although most candidates were able to graph the correct shape, they did not take into account the domain and range of this function.

Many were inattentive to the asymptotic nature of the function. Very few actually drew the asymptote, which in this case was a relevant feature.

When finding an expression for *g*, many reversed the direction of one or both of the transformations. The vertical translation was usually correct, but the horizontal shift was poorly done. The most common error was to obtain $g\left(x\right)=e^{x+4}+1$.

Question 6: geometric sequences and series

Many found this question accessible, although the most common approach was to calculate each term by brute force, which at times contained small errors or inaccuracies that affected the overall sum. Although this was a valid method, it meant an inefficient use of time that could have affected the performance on other questions.

Those who applied the formula for geometric series were typically more successful and far more efficient in answering the question.

Question 7: discriminant of a quadratic function

Many candidates knew to set the equations equal, and then some knew to manipulate the equation such that it is equal to zero. Those who recognized the discriminant in this equation earned further marks, although few set a correct discriminant greater than zero. Even in such cases, finding both inequalities proved elusive for most.

An alternative method was to graph each function and find where the line intersects the parabola in exactly one and in two places. Few could carry this approach to adequate completion, often neglecting a second inequality for *k*.

Question 8: equation of a tangent, area between curves

Many used their GDC to find correct values for *p* and *q*.

In finding the value of the derivative at *p*, most took an unnecessary analytic approach where the GDC can give a numerical value quickly from the graphing screen. Some candidates found the derivative function as a final answer, not recognizing that a value was required.

Many candidates were familiar with finding the equation of the normal. On some occasions candidates found the equation of the tangent instead. Not all candidates knew how to find the gradient of the normal, or found the negative reciprocal of a different value from the one they had found in (b).

It was not uncommon in part (d) for candidates to find the area between *f* and *g*, which shows misunderstanding of the question.

A considerable number of candidates took an analytic route to solve the problem, making many errors and thus showing that they did not know how to make an effective use of their GDC.

Question 9: normal and binomial distributions, conditional probability

Surprisingly, a significant number of candidates did not understand that standardized values can answer this question easily on the GDC. Some students could only find the probability by using a specific value for the standard deviation, others did not show any work and just wrote the answer. A few candidates that tried to remember the probabilities related to 1 or 2 standard deviations from the mean were sometimes wrong or inaccurate.

Part (b) was a "show that" question for which many students worked backwards using $\sigma = 2$ to verify that the probability was 0.975. A large number of candidates treated the 0.975 as a Z-score.

For part (c), not many candidates drew diagrams, choosing the wrong side of distribution leading to answer of 51.3 that was greater than the mean. This impacted their ability to successfully answer part d) of the question.

In part (d), most candidates did not recognize the conditional nature of the question in (i), often finding P(t<50.1) as a final answer. In (d)(ii), many of them recognised the binomial nature of the problem but a small proportion found the correct answer as they often tried to find $P(X = 2)$ instead of $P(X \geq 2)$.

Question 10: rule of cosines and area of segments

Those who attempted part (a) could in general show what was required by using the cosine rule. On rare occasions some more complicated approaches were seen using half of angle theta. In some cases, candidates did not show all the necessary steps and lost marks for not completely showing the given result.

A number of candidates correctly answered part (bi) and created a correct equation in (bii), but did not solve the equation correctly, usually attempting an analytic method where the GDC would do. For many a major problem was to realize the need to reduce the equation to one variable before attempting to solve it. Occasionally, an answer would be written that was outside the given domain.

When part (c) was attempted, many candidates did not recognize that the area in question requires the subtraction of a segment area, and often set the square area greater than twice the sector. Many candidates made mistakes when trying to eliminate brackets or just did not use them. Of those who created a correct inequality, few reached a fully correct conclusion.

Recommendations and guidance for the teaching of future candidates

There is a significant number of candidates that still show difficulties in deciding when a question requires the use of a GDC, and when it is relevant to use it. There are cases when it is possible to use the GDC or take an algebraic route, which is usually longer and leads candidates to a number of errors. It is important to take time in class to discuss with students how to show their work; and remind them that the use of calculator notation such as binompdf or invnormal is not considered correct working.

Teachers must also stress the importance of checking the mode of their calculators to determine if they are using radians or degrees when working with angles and trigonometric functions, and that it is probable that students will have to switch from one to the other during the exam, if required.

It is important to remind candidates of the importance of carrying through more than three significant figures in their working, as this may lead to inaccurate answers.

More emphasis in “Show that” questions is needed to avoid working backwards procedures and to make sure candidates show all the relevant steps, whatever those might be.

While sketching graphs from the GDC screen may seem a straightforward task, students must pause to consider a mathematical understanding of the function in question. If there is asymptotic behaviour, for example, the sketch should reflect this understanding. If there is a given domain, endpoints can be plotted. While absolute precision is not the goal of a sketch, reasonable attention to accuracy is expected, which can easily be aided by means of the GDC.

A more firm understanding of the normal distribution would benefit a number of candidates. Too often it seemed that students reached for the GDC to find answers before pausing to reflect on the nature of the question. The simple act of drawing a sketch may be helpful in making interpretations before calculations.

A large number of candidates still have difficulties recognizing conditional probability problems. A detailed analysis of these would be beneficial.

The solution of equations proves challenging to candidates. Deciding whether it is suitable to use their GDC or if it can be solved algebraically should be the focus of the work needed.

There were various comments on the G2s on all components about terminology and notation, but these were consistent with the guide. Teachers sometimes seem unaware of the notation list, neither do they realise that there are differing terms for the same thing (especially in French and Spanish), but IB policy is to use the guide.

Teachers should realise that the examination paper is designed such that the harder questions are generally 6 and 7 in section A and 9,10 in section B. These questions will usually assess conceptual understanding as well as procedural competency.