AQA

AS MATHEMATICS

Unit Mechanics 1B
Report on the Examination

6360
June 18

Version: 1.0

Further copies of this Report are available from aqa.org.uk

General

There were several questions which all students found accessible, with others that proved to be more challenging. The use of vectors was much better than has been seen in recent examinations.

Question 1

This question was generally done well with many students gaining full marks. Some students gave the acceleration as a vector in part (b) and did not find its magnitude.

Question 2

Part (a) was done very well, although a few students gave the answer 6.4 instead of 3.2. Part (b) was also done well. In part (c), a lot of students used the distance travelled instead of the displacement, which gave the average speed rather than the average velocity.

Question 3

This question was done very well by almost all students, with marks mainly lost due to arithmetic errors. A few students used $2m$ rather than $(2 + m)$ as the total mass after the collision. Another common error was to use the difference between the 'before' momentum terms rather than the sum.

Question 4

This question caused problems for many students as they were unable to construct the correct velocity triangle. Often an application of the cosine and sine rules was seen but with the wrong triangle. Some students used components, but basically made the same error. A few students treated the problem as if the velocity triangle was a right-angled triangle.

Question 5

There were some good explanations in part (a), but many students included the acceleration which complicated their working. Some also included a $4g$ term.

In part (b), there were again some good responses. Common errors were due to sign errors in their equations or not forming two equations. Again, some students included a $4g$ term. Some students assumed that the tension would be the same as in part (a).

In part (c), there were often good responses from the students who realised that they needed to find a new acceleration. Many students used other values, typically 0.6 or 9.8 for the acceleration. There were some good answers to part (d), but there were also a number that did not present a clear argument. Some students made incorrect remarks, for example that air resistance increases with speed. A few students did not state what they thought would happen to the distance.

Question 6

Many students did well on this question. A few did not find the angle of projection and appeared to assume that the motion took place on a vertical line. Some students did not find the correct angle of projection, which hampered their solutions. In some cases, students used the horizontal and

vertical equations in the wrong parts of the question. There were quite a number of good responses to part (b).

Question 7

This question was quite demanding with very few good responses. In part (a), there were many confused responses, many based on the use of constant acceleration equations rather than forces. Common errors included only considering the friction and including extra terms, such as 4. If the students did not make good progress with part (a), they were often unable to make much progress with parts (b) and (c), although many gained a method mark in part (b) for using their acceleration.

In part (c), only a few students were able to create an accurate argument to find the total time. Many did not realise that a new acceleration was required for the motion down the slope.

Question 8

Many students did very well with this question and gained full marks. The main causes of error were not using the initial positions or using them inappropriately by equating them to the velocity vectors. Also, velocity vectors were often equated to each other rather than position vectors.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.

UMS conversion calculator www.aqa.org.uk/umsconversion