Commentary on candidate evidence

The candidate evidence has achieved the following marks.

Candidate 1

Question 3

The candidate was awarded **3 marks** because the answer was correct including units

Question 15

The candidate was awarded **2 marks** because they didn't clearly use conservation of energy with the combined mass. The final mark was automatically lost (general marking principle (m))

Candidate 2

Question 4

The candidate was awarded **3 marks** because in part b, there is an arithmetical error in line 3

Question 8

The candidate was awarded **5 marks** because there is an arithmetical error after the award of mark 4

Question 10

The candidate was awarded **5 marks** because in part b, their answers did not follow from their working and they rounded to only 1 significant figure

Question 14

The candidate was awarded **4 marks** because there is an arithmetical error after the award of mark 4

Question 15

The candidate was awarded **1 mark** because there was no evidence of using the conservation of momentum and the conservation of energy was incorrect. The final mark was automatically lost (general marking principle (m))

Question 17

The candidate was awarded **3 marks** because in part a there was a transcription error in the integration that led to a further inconsistency. In part b, the final answer was expressed as a rounded irrational multiple of pi

Question 18

The candidate was awarded **3 marks** because in part b, there was no evidence for any of the marks and the motion was not described correctly in part c.

Candidate 3

Question 1

The candidate was awarded **1 mark** because in part a, there is an arithmetical error in line 3, and the units were inconsistent

Question 3

The candidate was awarded **3 marks** because in part b, there is an arithmetical error in line 3

Question 7

The candidate was awarded **2 marks** because there is an error in the rearranging of the equation in line 7

Question 10

The candidate was awarded **6 marks** because there is an arithmetical error after the award of mark 6

Question 14

The candidate was awarded **4 marks** because there is an arithmetical error leading to the first mark being withheld but the rest of the working follows correctly after the error.

Question 15

The candidate was awarded **1 mark** because there was no evidence of using the conservation of momentum and the conservation of energy was incorrect. The final mark was automatically lost (general marking principle (m))

Question 17

The candidate was awarded **5 marks** because in part b there was an error in the integration in line 4.

Question 18

The candidate was awarded 1 **mark** because in part a, although the crossed-out working can be marked, there is no evidence for any of the marks. There was no response for part b, but the explanation for the final mark is accurate.

Candidate 4

Question 1

The candidate was awarded **2 marks** because the units were inconsistent

Question 16

The candidate was awarded **2 marks** because there is an arithmetical error in part a after the award of mark 2. In part b, there are several errors when using Newton's second law and in the subsequent calculations.

Question 17

The candidate was awarded **5 marks** because in part b, the final answer was expressed as a rounded irrational multiple of pi.

Question 18

The candidate was awarded **4 marks** because in part b, there is no evidence for any of the marks other than mark 5.

Candidate 5

Question 1

The candidate was awarded **0 marks** because the candidate did not use vectors in their calculations and hence the final mark for calculating the magnitude of the vector was unavailable.

Question 13

The candidate was awarded **2 marks** because after the award of the first two marks, there is no evidence of obtaining an expression for angular velocity and hence the final mark was automatically lost (general marking principle (m))

Question 16

The candidate was awarded **6 marks** because this is a perfect example of an answer to this question.

Question 17

The candidate was awarded **5 marks** because in part a, the constant of integration has been omitted.

Question 18

The candidate was awarded **4 marks** because in part b, there is only evidence for mark 6.

Candidate 6

This was an almost perfect paper with the exception of the following 2 errors

Question 8

The candidate was awarded **5 marks** because the assumption was incorrect

Question 11

The candidate was awarded **3 marks** because there is an arithmetical error in part b after the award of mark 3.