Answers to Part A

1. To keep up with demand, the ideal length of time that the ride should take is no more than 3.5 mins.

**The ride takes 200 sec or 3 mins and 20 secs therefore satisfying this requirement (Domain)

- 2. The structure should be no higher than 90 m and dip no more than 5 m into the pool.
- **The max height is approximately 78 m and the ride dips approximately 3 m into the pool therefore meeting the specifications (Range)
 - **3.** The amount of time that the ride is under water can be no more than 5 seconds.
- **The dip underwater lasts longer than 5 seconds (Negative part of graph).

Recommendations: The length of time that the ride stays under water must be reduced to meet specifications.

- **4.** For every uphill climb there is a subsequent fall and any change in direction cannot occur in a time period of less than 1 second.
- **There are 5 increases and 5 decreases in the graph (Increasing and Decreasing) and each peak appears to occur in more than 1 second (although the students may be suspicious of the third dip and comment on this).
 - 5. There can be no point in the ride where the ride stops.
- **There are no points were the graph does not progress in time (definition of a function). NOTE: Students may mistakenly consider the constant part of the graph to be a stop in the ride.
 - 6. To prevent injury, at no point can the ride fall more than 20 m in a period less than or equal to 1 second.
- **This would be the same as 100 m in a period of 5 seconds (or 20 vertical grid lines over 1 horizontal grid line). There is no part of the graph that is this steep.

Answers to Part B – similar answers are acceptable

- 1. What is the total length of time Jimmy has been investing?
- 2. What is the lowest profit to the highest profit in Jimmy's investment?
- 3. Over which years was Jimmy's investment showing growth in profit?
- 4. Over which years was Jimmy's investment showing falls in profit?
- 5. Over which years was Jimmy's investment showing stable profit?
- 6. Over which years was Jimmy's investment making profit?
- 7. Over which years was Jimmy's investment not making profit?
- 8. What was the highest peak profit Jimmy's investment ever made and what was the second highest peak profit Jimmy's investment ever made?
- 9. What was the lowest profit Jimmy's investment ever made? Was there a second low dip in his investment?