

Question 16 (continued)

- (a) Outline TWO changes that could be made to the experimental procedure that would improve its accuracy. 2

- record the period of each length three times and take the average value of period.  
 - ~~use~~ time the period of <sup>the</sup> range of length from 0.14 m to 0.24 m instead of from 0.08 m to 0.19 m

- (b) Compare Kim's and Ali's methods of calculating  $g$  and identify the better approach. 3

Ali's method is more accurate because she ~~test~~ calculated ~~the~~  $g$  from sketching a graph of line of best fit, the line of best fit eliminates errors made in the experiment by taking ~~the~~ average values <sup>of each length</sup> that forms a straight line, whereas in Kim, she calculated from the raw values which included errors such as time delay in timing the period, so ~~with~~ with more errors included in calculation, Kim is less accurate than Ali.

- (c) Calculate the value of  $g$  from the line of best fit on Ali's graph. 3

take a point on the line of best fit:  $(0.12, (0.70)^2)$   
~~g = 9.67~~  $T = 2\pi \sqrt{\frac{L}{g}}$   
 $(0.70)^2 = 4\pi^2 \left(\frac{0.12}{g}\right)$   
 $g = 9.67 \text{ m/s}^2 \text{ (7dp)}$

End of Question 16