Question 16

Marks

Question 16 (continued)

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

- Allow the pendulum to swing 10 times, record the time and divide it by 10 to calculate the time for one period. This decreases systematic errors
- Repeat experiment 5 times for each length then find an average of the 5 readings.

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

Ali's method is more accurate than Kim's method as Ali uses a line of best fit so decreases his systematic error and will have more accuracy in calculating g than Kim.

A better approach would be to not use a line of best fit, and calculate the gradient of each line and then find the average and which make it equal to $4\pi^2/g$ and find g.

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

$T^2 = 4\pi^2(L/g)$

$T^2 = \frac{4\pi^2}{g} L$

gradient of line $\doteq 1/0.24 \doteq 4.17$

$\therefore \frac{4\pi^2}{g} = 4.17$

$g = \frac{4\pi^2}{4.17}$

$g \doteq 9.47 \text{ ms}^{-2}$

End of Question 16