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 back and forth twice before starting to time, to make sure there is no additional momentum from releasing the pendulum when you let go
- Calculate the time for 10 oscillations, and find the "T", from the 10 oscillations

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

Kim: in accounting for all the values of "T", kim is including those values which have apparent error in them. By finding the mean she is simply including unnecessary error into her value of "g"

Ali: on the other hand, from using the line of best fit, she can not include those values of error, thus she can find an accurate value of "g" from the line of best fit. Thus Ali's approach is more accurate than kim's.

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

$T = 2\pi\sqrt{\frac{L}{g}}$: $T^2 = 4\pi^2\left(\frac{L}{g}\right)$: $g = \frac{4\pi^2\left(\frac{L}{T^2}\right)}{}$

taking pts $(0.24, 0.98)$, $(0,0)$ gradient: $\frac{y_1 - y_2}{x_1 - x_2} = \frac{0.98}{0.24}$

18

$\therefore \frac{T^2}{L} = 4.0833$: $\frac{L}{T^2} = 0.244898$

$g = 9.66818\ ms^{-2}$

$= 9.67\ ms^{-2}$

End of Question 16