

## PH201 Postlab 3: Acceleration on an Incline

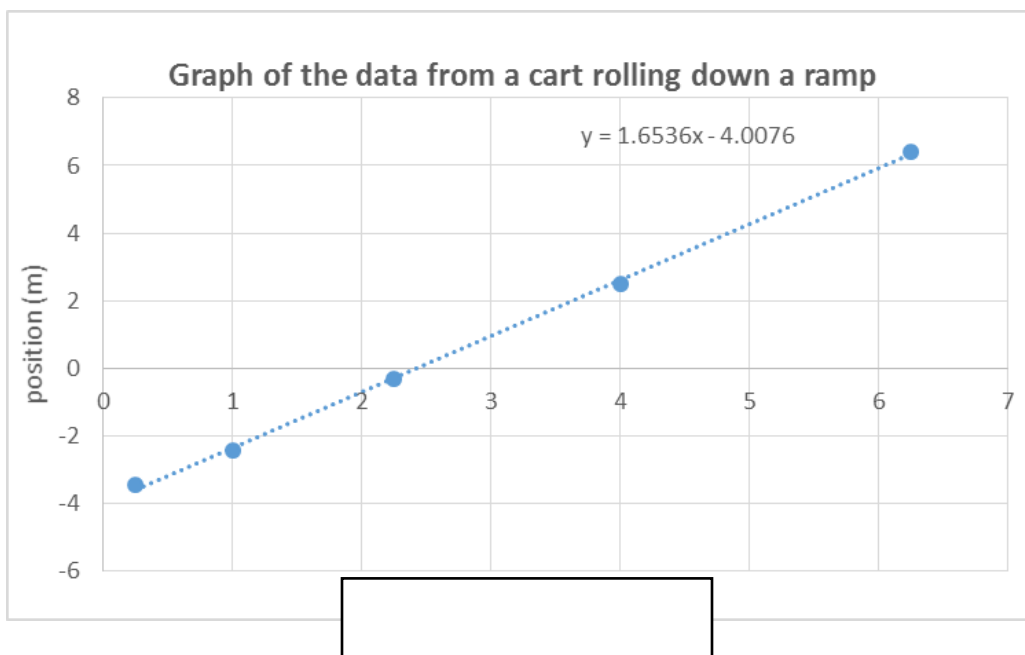
1. In your lab you measured the height of some blocks. What if you were measuring the height of Madrone hall?

a. What is a reasonable experimental error for this measurement?

2. I have position and time (in seconds) data for a cart moving in a straight line down a slope – plotted below, table on the right. I know that the cart starts from rest. I assume the acceleration of the object should be constant, and I know that the relationship between position and time with constant acceleration is  $x(t) = x_i + \frac{1}{2}at^2$ .

Time (s)	Position (m)
0.50	-3.469
1.0	-2.445
1.5	-0.302
2.0	2.511
2.5	6.404

a. What did the experimenter plot on the graph in order to get a straight line – fill in the horizontal label for the graph below (including the correct units!)?



b. Using the graph, what is the acceleration ( $a$ ) of the object?

c. Using the graph, what is the starting point ( $x_i$ ) of the object?

d. If the slope of the ramp is  $20^\circ$  with respect to the horizontal, what is the percentage of difference from your expected acceleration to the experimental determined acceleration?

Hint:  $\% \text{ difference} = \frac{|a_{\text{calc}} - a_{\text{expt}}|}{a_{\text{calc}}} \times 100\%$ , and use the equation from lab to calculate  $a_{\text{calc}}$ .