

### 3.1 Creating a Quadratic Model Using Graphing Technology:

#### Finding the equation using Desmos

Enter your table in Desmos by going to the Add item button and clicking the table  
 Enter the following data:



|            |   |    |    |    |    |    |   |
|------------|---|----|----|----|----|----|---|
| Time (s)   | 0 | 1  | 2  | 3  | 4  | 5  | 6 |
| Height (m) | 2 | 27 | 42 | 48 | 43 | 29 | 5 |

Find your Equation by typing the following after your table

standard form

$$y_1 \sim ax_1^2 + bx_1 + c$$

You get  $y_1$  by typing  $y$  then  $1$  similarly for  $x_1$

You can find the  $\sim$  symbol by clicking (they symbol is in the last row)



The  $R^2$  represents how well the data fits the equation  
 The closer it is to 1 the better the fit

$$y_1 \sim ax_1^2 + bx_1 + c$$

we will not be discussing the residues at this time:

you will then see your a,b and c values:

|            |            |
|------------|------------|
| STATISTICS | RESIDUALS  |
| $R^2=1$    | $e_1$ plot |
| PARAMETERS |            |
| $a=1$      | $b=0$      |
| $c=0$      |            |

State an equation that models the situation:

Use your Equation to make a prediction: sub in an  $x$  value

Use your graph to determine the max height of the object and when it occurs (ie find the vertex by clicking the point):

Use your graph to determine when the object lands

(ie find the zeros by clicking the points):

You can also find different forms of the equation:

vertex form

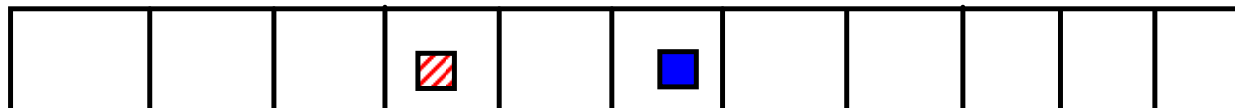
$$y_1 \sim a(x_1 - h)^2 + k$$

factored form

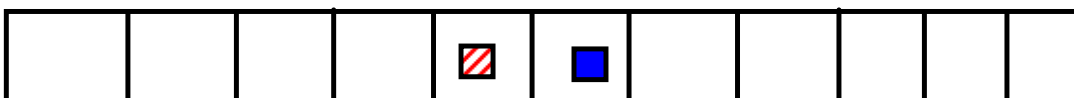
$$y_1 \sim a(x_1 - r)(x_1 - s)$$

Now Complete the Golf Ball Rolling and Leap Frog Task

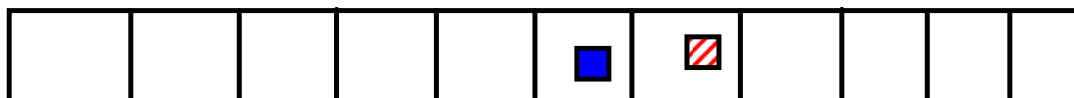




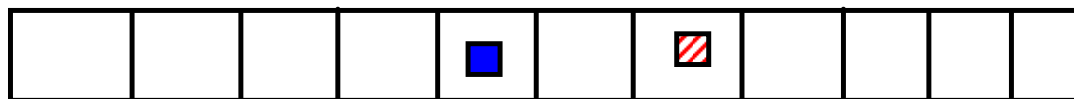
1



2

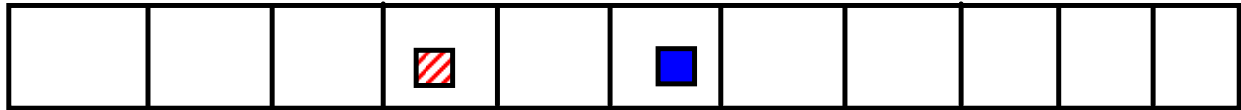


3

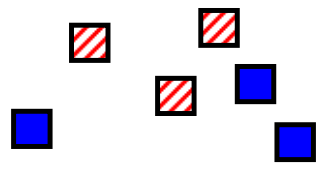




### Leap Frog Task (p130 text; A-I)

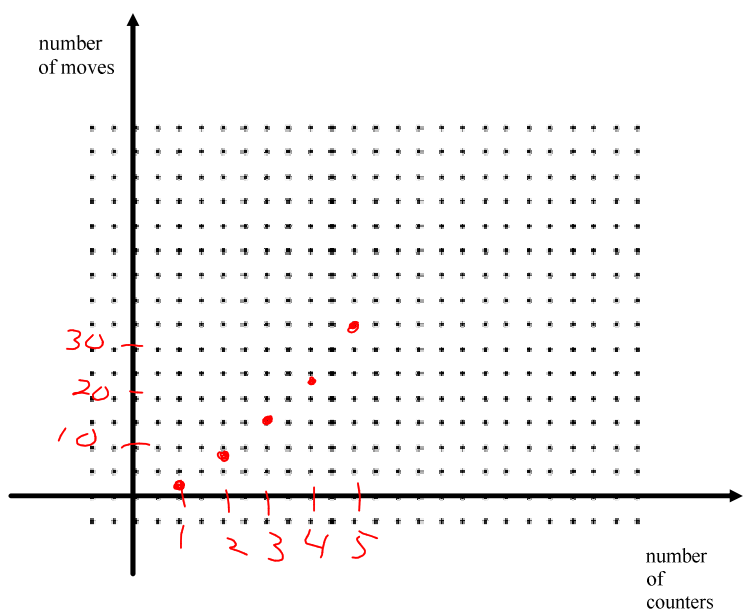


| # of counters | Record of counters moves | Total number of moves |
|---------------|--------------------------|-----------------------|
| 1             |                          |                       |
| 2             |                          |                       |
| 3             |                          |                       |
| 4             |                          |                       |
| 5             |                          |                       |



#### Recording and analyzing data

| number of counters | number of moves |
|--------------------|-----------------|
| 1                  | 3               |
| 2                  | 8               |
| 3                  | 15              |
| 4                  | 24              |
| 5                  | 35              |



Homework:

Read page 170 Example 1

Do Investigate A-F, I-J

