

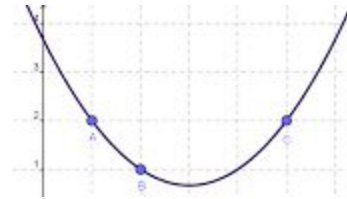
3.11 Curve Fitting

1. Curve Fitting

a. 2pts determine a line
 $y=mx+b$



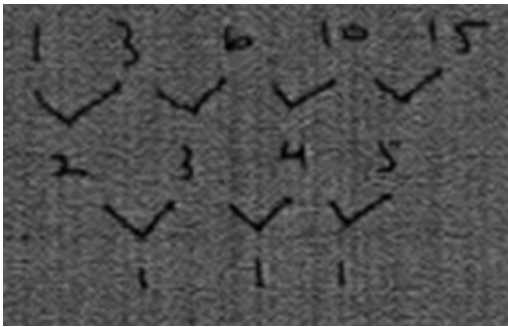
b. 3 non-collinear points determine a parabola (one is not necessarily the vertex) $y = ax^2 + bx + c$



2.

x	1	2	3	4	5	...
y	1	3	6	10	15	...

Is this linear? (No, y is not increasing by a constant)



1st differences - not the same

2nd differences- are the same which tells you 2nd degree

3. Using 3 pts to find eq of a parabola

$$y = ax^2 + bx + c$$

$$(1,1) \quad 1 = a(1^2) + b(1) + c \quad 1a+1b+c=1$$

$$(2,3) \quad 3 = a(2^2) + b(2) + c \quad 4a+2b+c=3$$

$$(3,6) \quad 6 = a(3^2) + b(3) + c \quad 4a+3b+c=6$$

Matrix, rref $a=1/2 \quad b=1/2 \quad c=0$

$$y = \frac{1}{2}x^2 + \frac{1}{2}x$$

Try (0,2) (1,1) (-2,-1) *first make sure not linear