MHF4UI DETERMINING THE EQUATION OF A GRAPH

Given the graph of a polynomial function and the coordinates of the points on a graph, there are 3 ways to determine the equation:

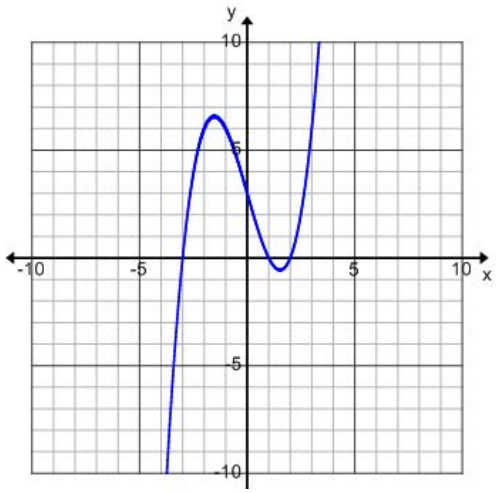
1)
2)
3)

USING THE ZEROS (AND ONE OTHER POINT)

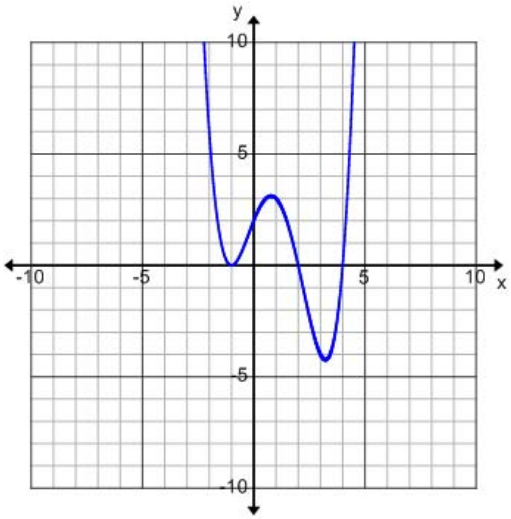
Examples

Determine the equation of the following functions.

1.



2.

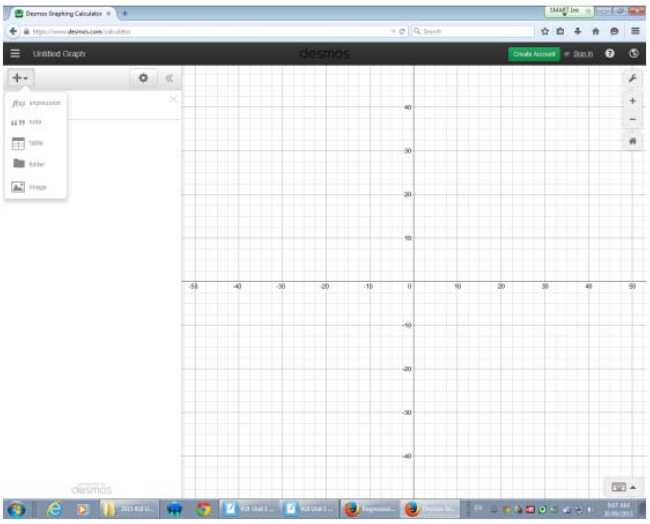


DETERMINING AN EQUATION USING REGRESSION

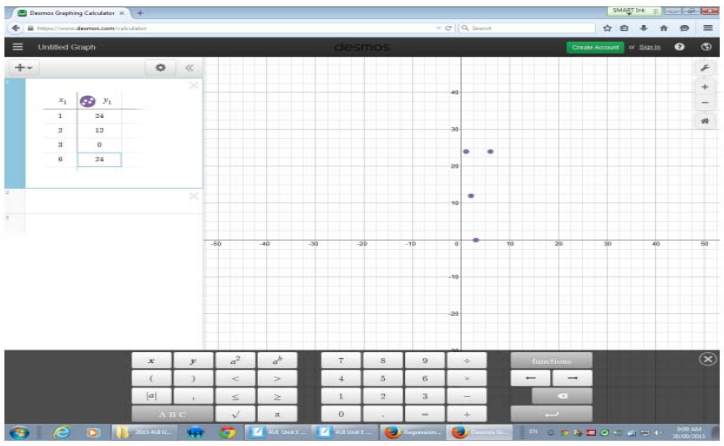
Given the following points determine the equation of the function.

x	y
1	24
2	12
3	0
6	24

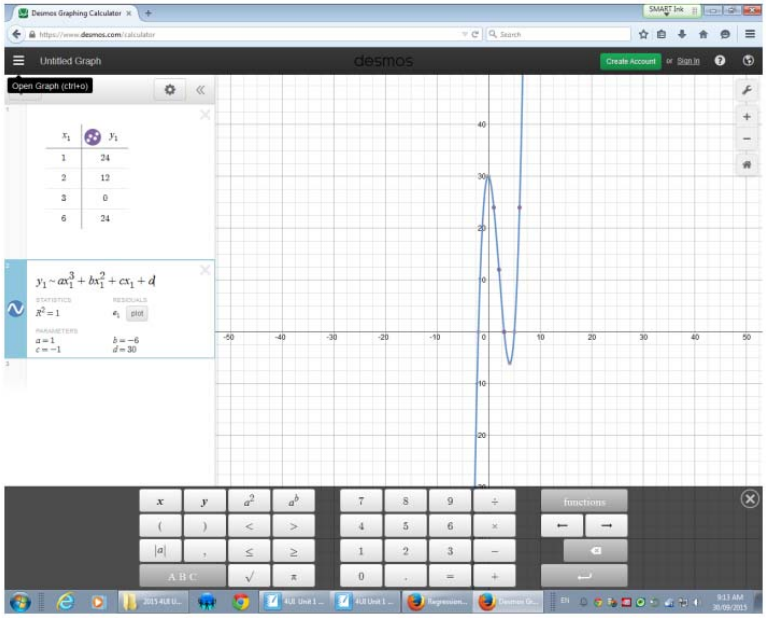
Step 1: Add a table to record your data.



Step 2: Input the data into your table.



Step 3: Add a new equation that is the general form for the function we think this would be (in this case a cubic.... $y=ax^3 + bx^2 + cx + d$) except use: x_1 in place of the x so that Desmos knows to use the data we entered in x_1 in our table) ~ instead of equal sign so Desmos knows it doesn't have to be a perfect fit



HOMEWORK

Page 101 #4 Zeros and a Point
a) (0, 2), b) (2, 3), c) (3, -5), d) (1, -3/2)
Page 102 #3ab Finite Differences
Page 102 #4bcd Regression

ANSWERS

4. a) $y = 1/5(x+2)(x-1)(x-5) = 1/5x^3+4/5x^2-7/5x+2$
4. b) $y = -3/20x(x+3)(x-4) = -3/20x^3+3/20x^2+9/5x$
4. c) $y = 5/16(x+1)^2(x-2)(x-4) = 5/16x^4-5/4x^3-15/16x^2+25/8x+5/2$
4. d) $y =-3/32x(x+3)(x-2)(x-5) =-3/32x^4+3/8x^3+33/32x^2-45/16$
3. a) $y = x^3-x+2$
3. b) $y = -x^3+4x^2-x-6$
4. b) $y = x^3+4x^2-x-3$
4. c) $y = -x^3+x^2+x+3$
4. d) $y = -x^4+5x^3-4$