**CUBICS which factorise as well as their derivatives.**

***It is hard to find a cubic f(x) which factorises AND its derivative f ꞌ(x) also factorises too!***

***Here are a few I discovered:***

***1. y = x(x + 9)(x – 15)***

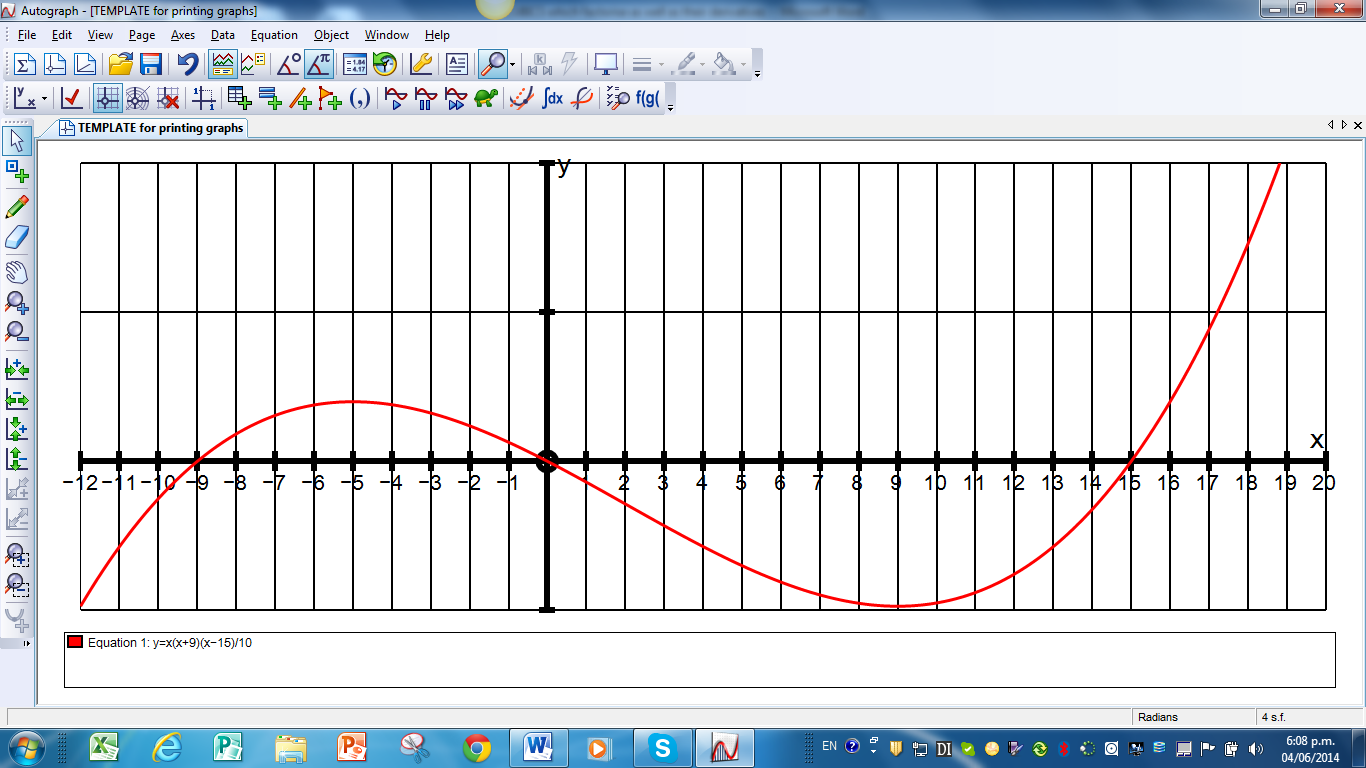
***= x(x2 – 6x – 135)***

***= x3 – 6x2– 135x***

***y ꞌ = 3x2 – 12x – 135***

***= 3(x2 – 4x – 45)***

***= 3(x + 5)(x – 9)***



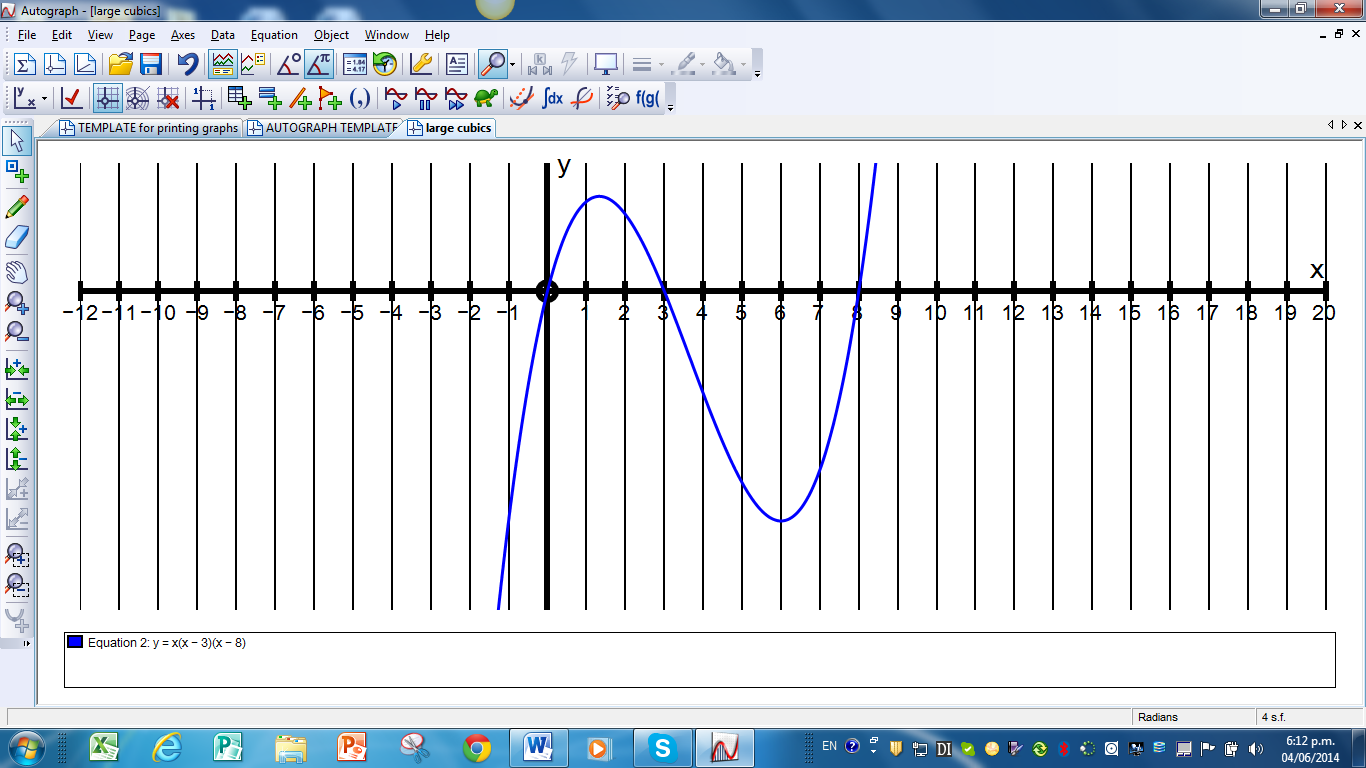
***2. y = x(x – 3)(x – 8) also (x + 3)x(x – 5) just by translating 3 to the left.***

***y = x(x2 – 11x + 24)***

***y = x3 – 11x2 + 24x***

***y ꞌ = 3x2 – 22x + 24***

***= (3x – 4)(x – 6)***



***3. y = x(x – 9)(x – 24)***

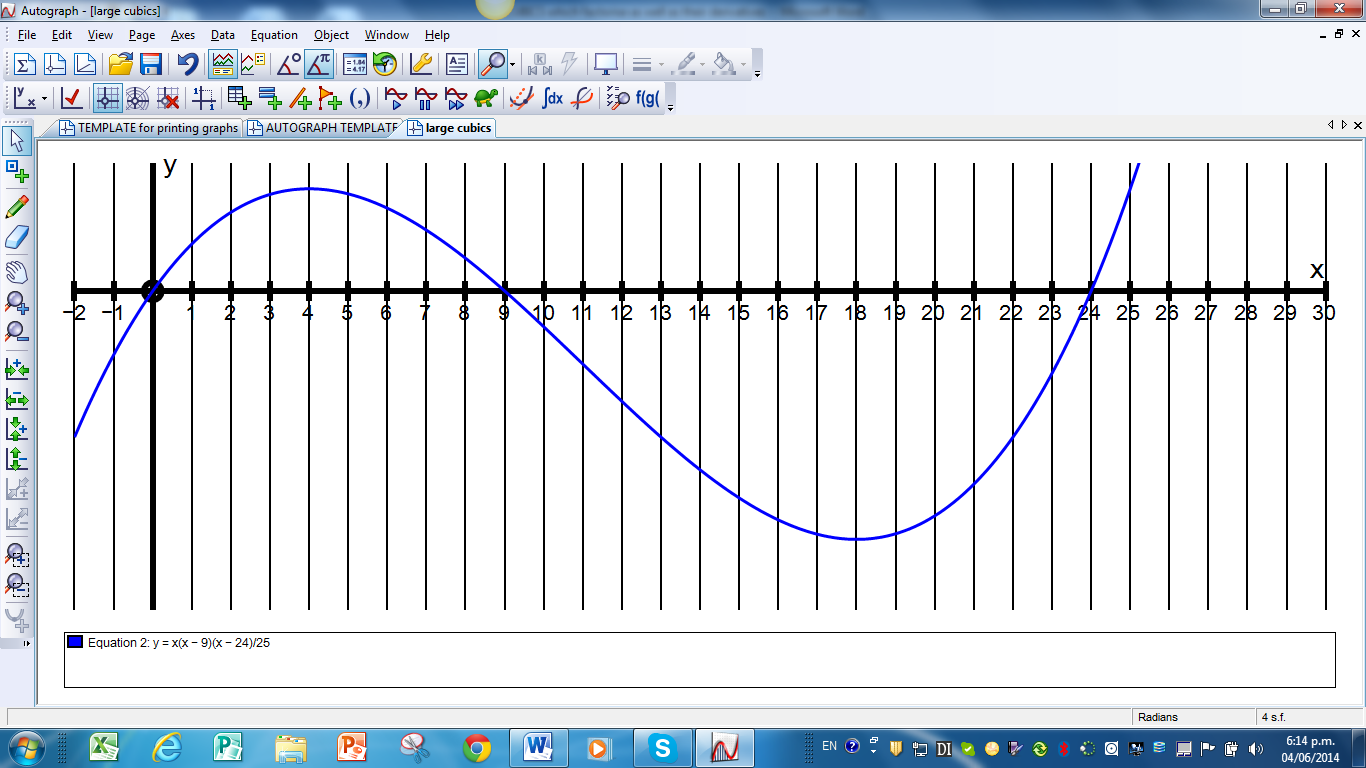
***y = x(x2 – 33x + 216)***

***y = x3 – 33x2 + 216x***

***y ꞌ = 3x2 – 66x + 216***

***= 3(x2 – 22x + 72)***

***= 3(x – 4)(x – 18)***



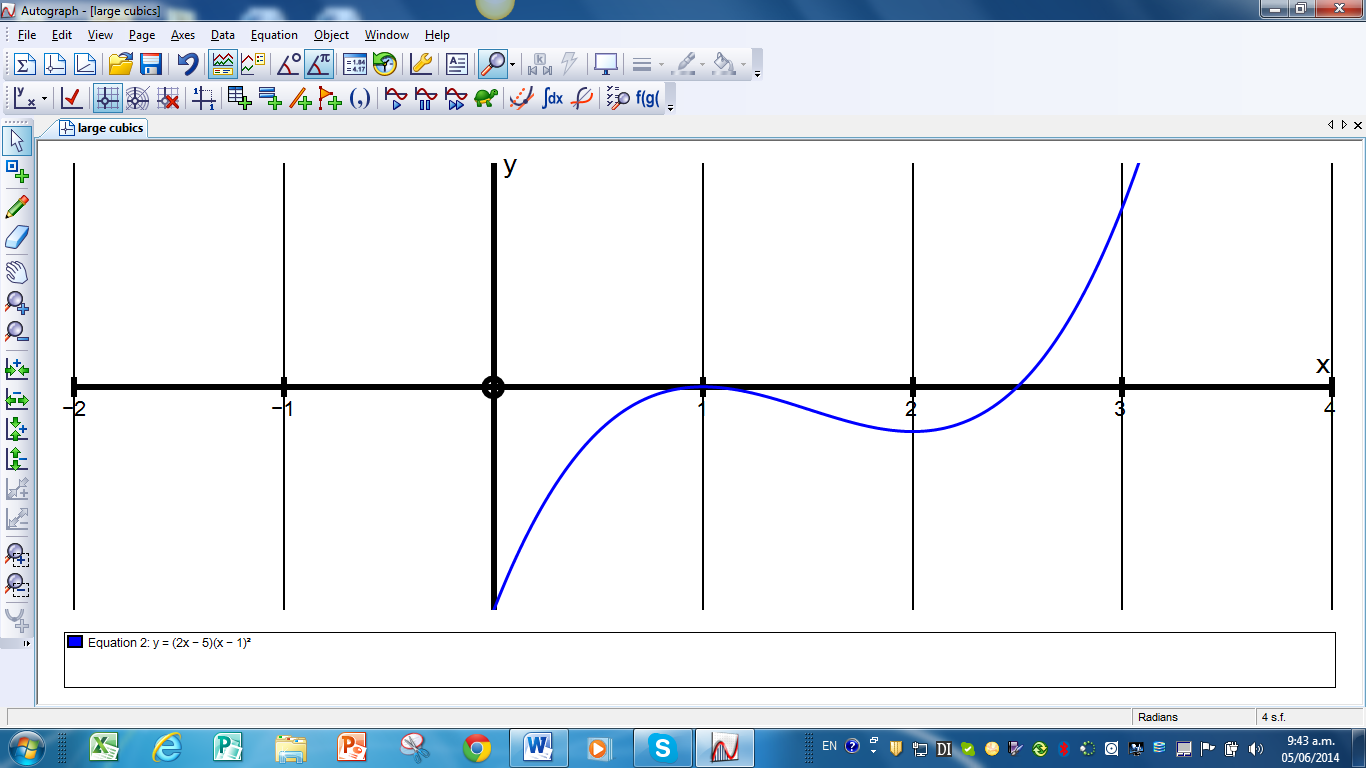
***4. y = (2x – 5)(x – 1)2***

***y = 2x3 – 9x2 + 12x – 5***

***y ꞌ = 6x2 – 18x + 12***

***= 6(x2 – 3x + 2)***

***= 6(x – 1)(x – 2)***



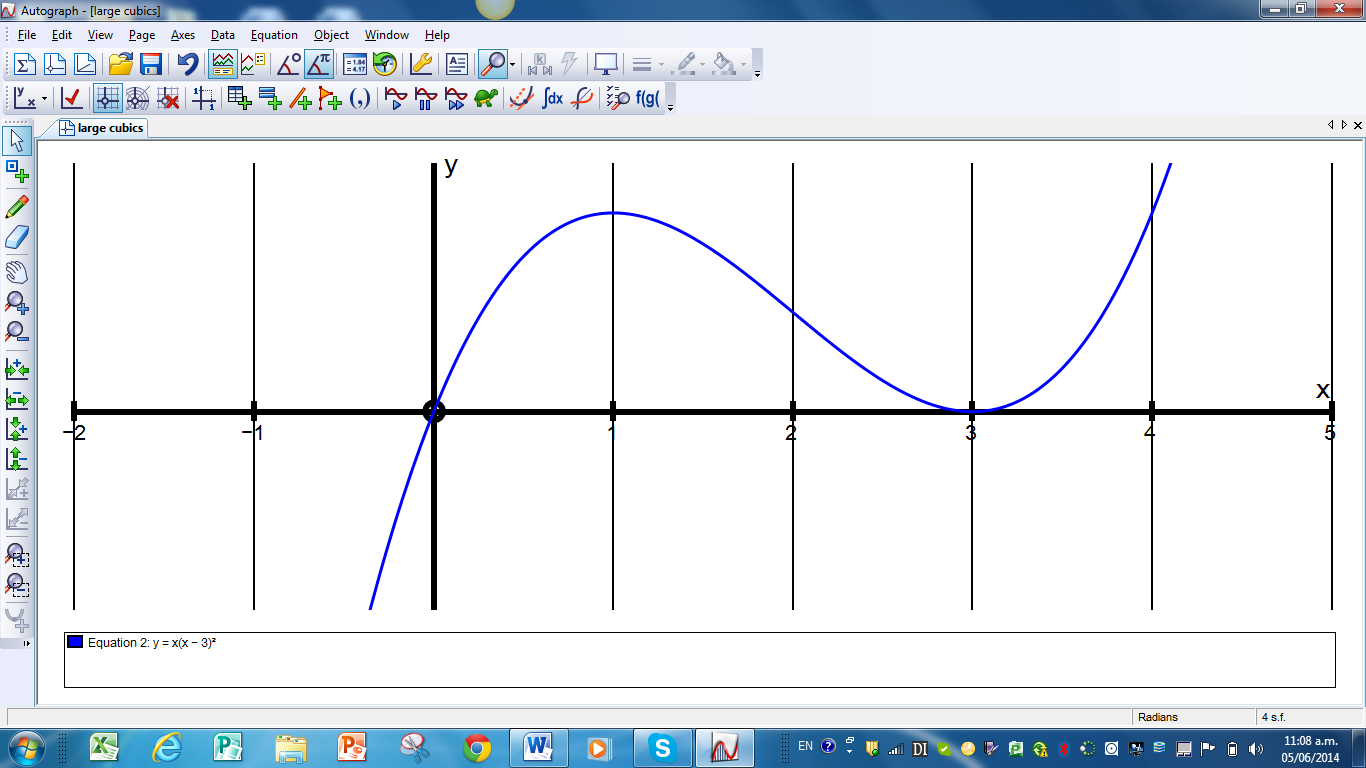
***5. Very common ones are like y = x(x – 3)2 where the min is obviously at x = 3***

***y = x3 – 6x2 + 9x***

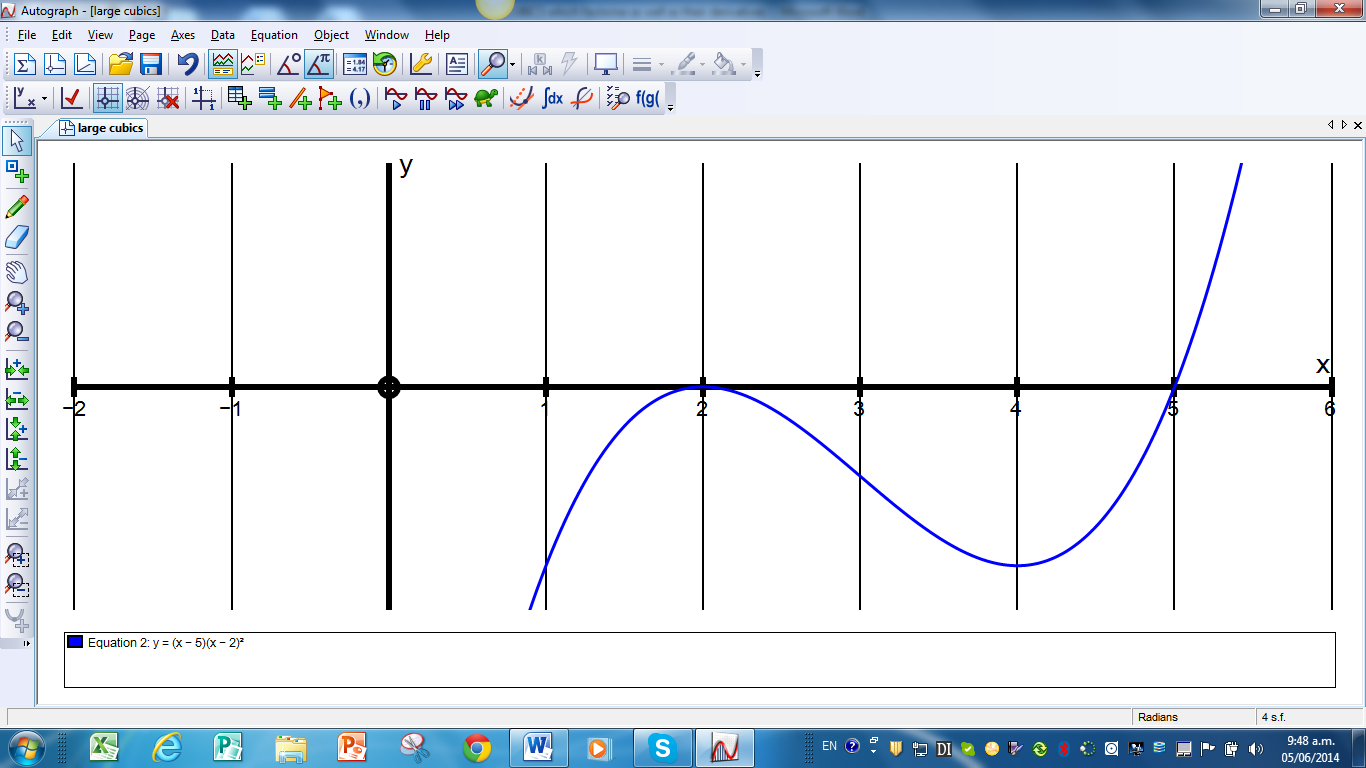
***y ꞌ = 3x2 – 12x + 9***

***y ꞌ = 3(x2 – 4x + 3)***

***= 3(x – 1)(x – 3)***



***5. y = (x – 5)(x – 2)2 which of course is just y = x2(x – 3) moved along 2***



***6. y =(x – 1)(x – 4)2 which of course is just y = x(x – 3)2 moved along 1***

