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1. (3) Assuming the solution of

$$y'' - 3x^2y = 0 (1)$$

has a series expansion about x = 0 work out the recursion relation and write out the first four non-zero term s if y(0) = 1 and y'(0) = 1.

2. (2) Assuming the solution of

$$y' - 3xy = 2 \tag{2}$$

has a series expansion about x = 0, work out the recursion relation and write out the first four non-zero terms.

3. (3) Use the Method of Froebenius to find series solutions for

$$xy'' + 2y' + xy = 0 (3)$$

about x = 0. Remember that to use the method of Froebenius you substitute

$$y = \sum_{n=0}^{\infty} a_n x^{n+r} \tag{4}$$

In this example you will find that there will only be one solution unless r is chosen to be zero or -1.

¹Conor Houghton, houghton@maths.tcd.ie and http://www.maths.tcd.ie/~houghton/ 2E2.html