Exercise sheet 10 for Math 263: ODEs for Engineers Matt Roberts
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1. What is the power series expansion of
   (a) x^3 about 2?
   (b) $\sin x$ about 0?
   (c) $\ln x$ about 1?
2. Consider the ODE
$$y'' - x^3 y = 0, \quad y(0) = 1, \;\; y'(0) = 0.$$
   By substituting the power series expansion $y = \sum_{n=0}^{\infty} a_n x^n$, develop a recurrence relation for a_{n+5} in terms of a_n and calculate $a_0, a_1, a_2, a_3, a_4, a_5$ and a_6.
3. Describe the form of the solutions to
$$y'' + \frac{\sin x}{x} y' + \frac{14 \cos x}{89 x^2} y = 0.$$

If you spot any errors, please inform me: `matthew.roberts@mcgill.ca`