Values

15   1. (a) Find the Taylor series about $x = 2$ for the function $\dfrac{1}{(3+2x)^{1/3}}$. Express your answer in sigma notation simplified as much as possible. You must use a technique that ensures that the series converges to the function.

       (b) What is the radius of convergence of the series?

13   2. (a) Find the Maclaurin series for the function $f(x) = \dfrac{x^4}{(4-3x)^2}$. Express your final answer in sigma notation simplified as much as possible.

       (b) What is the interval of convergence of the series?

12   3. Evaluate

$$\sum_{n=2}^{\infty} \frac{2^n}{(n+1)!}x^n.$$

Justify all steps in your solution.

10   4. Find, in explicit form $y = f(x)$, the solution of the initial value problem

$$x^2 y \frac{dy}{dx} + x^2 = 1, \qquad y(1) = 1.$$