Find the Taylor series representation for each function centered at the given value of a.

1. \( f(x) = 4 + 3x + x^2, \ a = 2 \)

2. \( f(x) = e^x, \ a = 1 \)

3. \( f(x) = \cos x, \ a = \frac{\pi}{2} \)

4. \( f(x) = \ln x, \ a = 2 \)

5. \( f(x) = \sin x^3, \ a = 0 \)
6. Use a known Maclaurin series to obtain the Maclaurin series for \( x^2 e^{-x} \)

7. Evaluate the indefinite integral as an infinite series: \( \int \frac{\cos x - 1}{x} \, dx \)

Use the Binomial series to expand the given function as a power series.

8. \( f(x) = \frac{1}{(1+x)^3} \)

9. \( f(x) = (1 - x)^{3/5} \)

10. \( f(x) = \frac{x^2}{\sqrt{x} + 2} \)