12.10

3-10: Find the Maclaurin series for $f(x)$ using the definition of a Maclaurin series. [Assume that f has a power series expansion. Do not show that $R_n(x) \to 0$.] Also find the associated radius of convergence.

3. $f(x) = \cos x$

4. $f(x) = \sin 2x$

5. $f(x) = (1+x)^{-3}$

6. $f(x) = \ln(1+x)$

7. $f(x) = e^{5x}$

8. $f(x) = xe^{x}$

11-18: Find the Taylor series for $f(x)$ centered at the given value of a. [Assume that f has a power series expansion. Do not show that $R_n(x) \to 0$.]

11. $f(x) = 1 + x + x^2,\ a = 2$

12. $f(x) = x^3,\ a = -1$

13. $f(x) = e^{x},\ a = 3$

14. $f(x) = \ln x,\ a = 2$

15. $f(x) = \cos x,\ a = \pi$

16. $f(x) = \sin x,\ a = \dfrac{\pi}{2}$

17. $f(x) = 1/\sqrt{x},\ a = 9$

18. $f(x) = x^{-2},\ a = 1$

23-28: use a Maclaurin series derived in this section to obtain the Maclaurin series for the given function.

23. $f(x) = \cos \pi x$

24. $f(x) = e^{-x/2}$

25. $f(x) = x \tan^{-1} x$

26. $f(x) = \sin x^4$

27. $f(x) = x^2 e^{-x}$

28. $f(x) = x \cos 2x$

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