

Additional Problems - Sec. 11.9

① Approximate e to

a) 5 decimal-place accuracy

b) ten decimal-place accuracy

• Check: a) requires $9 = n$ b) requires $13 = n$

② Use the Maclaurin series for $\cos x$ to approximate $\cos(\pi/20)$ to four-decimal-place accuracy. Ans. 0.9877

Additional Problems - Sec. 11.10

③ Derive the Maclaurin series for $\frac{1}{(1+x)^2}$ by differentiating an appropriate

Maclaurin series term by term.

Ans. $\sum_{k=1}^{\infty} (-1)^{k+1} k x^{k-1}$

④ Find the sum of the series

$$2 + 6x + 12x^2 + 20x^3 + \dots$$

[Hint: Find the second derivative of the Maclaurin series for $\frac{1}{1-x}$.] Ans. $\frac{2}{(1-x)^3}$

Approximate to 3 decimal-place accuracy:

⑤ $\int_0^1 \cos \sqrt{x} \, dx$ Ans. 0.764

⑥ $\int_0^{\frac{1}{2}} \frac{dx}{1+x^4}$ Ans. 0.494

⑦ $\int_0^{0.1} e^{-x^3} \, dx$ Ans. 0.100