3

a

CANCELLATION NEAR

$x = n\pi$

EXPAND $\cos(x)$ AS TRUNCATED TAYLOR SERIES:

$$1 - \cos x \approx 1 - \left[1 - \frac{x^2}{2!} + \frac{x^4}{4!}\right]$$

$$= -\frac{x^2}{2!} + \frac{x^4}{4!}$$

3
b

CANCELLATION NEAR

$x_1 \approx 0$

$x_2 \approx 2.08$

$x_3 \approx 7.83$

$x_4 \approx 7.88$

& FOR LARGE POSITIVE x

*ROOTS FROM WOLFRAM ALPHA

EXPAND e^{-x} & $\sin x$ IN TRUNCATED TAYLOR SERIES:

$$e^{-x} + \sin x - 1 \approx \left[1 - x + \frac{x^2}{2!}\right] + \left[x - \frac{x^3}{3!} + \frac{x^5}{5!}\right]$$

$$= \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^5}{5!}$$