

# MODIFIED EULER'S ONE-STEP METHOD:

Ex ONE FINDS

$k_1, k_2$

THEN,

$$\begin{aligned} \mu_{n+1} &= \mu_n + \frac{h}{2}(k_1 + k_2) \\ &= \mu_n + \frac{h}{2}(\mu_n(1+h) + \mu_n) \end{aligned}$$

$$\mu_{n+1} = \mu_n \left( 1 + h + \frac{h^2}{2} \right)$$

NOW ONE CAN APPROX  $\omega$   
 $\mu_{n+1}$

$$= \mu_n \left( 1 + h + \frac{h^2}{2} + h^2 \right) \checkmark$$

Proof

$$k_1 = 2\mu_n$$

$$k_2 = \mu_n(1+2h)$$

$$\text{NOW, } \mu_{n+1} = \mu_n + \frac{h}{2}(k_1 + k_2)$$

$$\mu_{n+1} = \mu_n + \frac{h}{2}(2\mu_n + \mu_n(1+2h))$$

$$= \mu_n + h\mu_n + \frac{h}{2}\mu_n(1+2h)$$

$$= \mu_n + h\mu_n + \frac{h}{2}\mu_n + \mu_n h^2$$

LESS  
APPARENT  
ERROR



LESS  
APPARENT  
ERROR  
(A.E.)

MORE  
A.E.



MORE  
A.E.

SOUND  
FREQUENTLY

MARKER  
WIDTH