1.

$\cos(0.75) = 0.7317$

$\cos(0.698) = 0.7661$

$\cos(0.733) = 0.7432$

$\cos(0.768) = 0.7193$

$\cos(0.803) = 0.6946$

degree 1:

$$f(x) = 0.7432 \cdot \frac{x - 0.768}{0.733 - 0.768} + 0.7193 \cdot \frac{x - 0.733}{0.768 - 0.733}$$

$f(0.75) = 0.731591428$, $error = |0.731591428 - 0.7317| \doteq 0.0001$

$error\ bound = \left| \frac{f''(\xi)}{2!} (0.75 - 0.733)(0.75 - 0.768) \right| \doteq 1.53 \times 10^{-4}$

degree 2:

$$f(x) = 0.7661 \cdot \frac{x - 0.733}{0.698 - 0.733} \cdot \frac{x - 0.768}{0.698 - 0.768} + 0.7432 \cdot \frac{x - 0.698}{0.733 - 0.698} \cdot \frac{x - 0.768}{0.733 - 0.768} + 0.7193 \cdot \frac{x - 0.698}{0.768 - 0.698} \cdot \frac{x - 0.733}{0.768 - 0.733}$$

$\Rightarrow f(0.75) = 0.7317$, $error = |0.7317 - 0.7317| = 0$

$error\ bound = \left| \frac{f^{(3)}(\xi)}{3!} (0.75 - 0.698)(0.75 - 0.733)(0.75 - 0.768) \right| \doteq 2.652 \times 10^{-6}$

degree 3:

$$f(x) = 0.7661 \cdot \frac{x - 0.733}{0.698 - 0.733} \cdot \frac{x - 0.768}{0.698 - 0.768} \cdot \frac{x - 0.803}{0.698 - 0.803} + 0.7432 \cdot \frac{x - 0.698}{0.733 - 0.698} \cdot \frac{x - 0.768}{0.733 - 0.768} \cdot \frac{x - 0.803}{0.733 - 0.803} + 0.6946 \cdot \frac{x - 0.698}{0.803 - 0.698} \cdot \frac{x - 0.733}{0.803 - 0.733} \cdot \frac{x - 0.768}{0.803 - 0.768}$$

$\Rightarrow f(0.75) = 0.7317$, $error = |0.7317 - 0.7317| = 0$

$error\ bound = \left| \frac{f^{(4)}(\xi)}{4!} (0.75 - 0.698)(0.75 - 0.733)(0.75 - 0.768)(0.75 - 0.803) \right| \doteq 3.51 \times 10^{-8}$

degree 4:

η 一個$\frac{b}{2}$.

2.

$y = x - e^x$

x	0.3	0.4	0.5	0.6	x
y	-0.440818	-0.270320	-0.106531	0.051188	0
	$\hookrightarrow y_1$	$\hookrightarrow y_2$	$\hookrightarrow y_3$	$\hookrightarrow y_4$	

$$x(y) = 0.3 \cdot \frac{(y-y_2)(y-y_3)(y-y_4)}{(y_1-y_2)(y_1-y_3)(y_1-y_4)} + 0.4 \cdot \frac{(y-y_1)(y-y_3)(y-y_4)}{(y_2-y_1)(y_2-y_3)(y_2-y_4)} + 0.5 \cdot \frac{(y-y_1)(y-y_2)(y-y_4)}{(y_3-y_1)(y_3-y_2)(y_3-y_4)} + 0.6 \cdot \frac{(y-y_1)(y-y_2)(y-y_3)}{(y_4-y_1)(y_4-y_2)(y_4-y_3)}$$

$\Rightarrow x(0) \doteq 0.5671426$

3.

用程式.

ⓐ D(10) = 1768.96 feet
V(10) = 74.64 ft/s

ⓑ 第一次超速時 V = 80.69 ft/s , t = 3.15 s.

ⓒ. Vmax = 92.04 ft/s