

1.

	degree	approximation	abs_error	error_bound
0	1	0.732077	0.000377	4.420000e-04
1	2	0.731716	0.000016	2.652000e-06
2	3	0.731704	0.000004	3.513900e-08
3	4	0.731704	0.000004	7.027800e-09

2.

$y = x - e^x$
 $x_0 = 0.3$
 $x_1 = 0.4$
 $x_2 = 0.5$
 $x_3 = 0.6$

$y_0 = 0.3 - 0.740818 = -0.440818$
 $y_1 = 0.4 - 0.670320 = -0.270320$
 $y_2 = 0.5 - 0.606531 = -0.106531$
 $y_3 = 0.6 - 0.548812 = 0.051188$

$y=0$, $x = \frac{(y-y_1)(y-y_2)(y-y_3)}{(y_0-y_1)(y_0-y_2)(y_0-y_3)} x_0 + \frac{(y-y_0)(y-y_2)(y-y_3)}{(y_1-y_0)(y_1-y_2)(y_1-y_3)} x_1$
 $+ \frac{(y-y_0)(y-y_1)(y-y_3)}{(y_2-y_0)(y_2-y_1)(y_2-y_3)} x_2 + \frac{(y-y_0)(y-y_1)(y-y_2)}{(y_3-y_0)(y_3-y_1)(y_3-y_2)} x_3 = 0.567143$

3.

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=== (a) t = 10 秒時的位置與速度 ===
位置：773.15 ft
速度：75.06 ft/s

=== (b) 是否超過速限 (55 mi/h ≈ 80.67 ft/s) ===
是的，第一次超速發生在 3.19 秒

=== (c) 預測最大速度 ===
最大速度為：91.40 ft/s
PS C:\Users\凌芷婕\OneDrive\桌面\.venv\C44101175_numerical_hw3>

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