Question **1**

Correct

Marked out of 15

(*Horner's Method*). Use Horner's method to evaluate the polynomial

$$f(x) = x^6 + 2x^5 + 3x^4 + 4x^3 + 5x^2 + 6x - 7$$

at the specified points. All numerical answers should be rounded to 7-digit floating-point numbers.

(i) Evaluate the polynomial $f(x)$ at the point $\alpha = 1.15$:

k	a_k		b_k
6	1 ✔	0 ✔	1.0 ✔
5	2 ✔	1.15 ✔	3.15 ✔
4	3 ✔	3.6225 ✔	6.6225 ✔
3	4 ✔	7.615875 ✔	11.61587 ✔
2	5 ✔	13.35825 ✔	18.35825 ✔
1	6 ✔	21.11199 ✔	27.11199 ✔
0	-7 ✔	31.17879 ✔	24.17879 ✔

Accordingly,

$f(1.15) \doteq$ 24.17879 ✔ .

(i) Evaluate the polynomial $f(x)$ at the point $\alpha = -1.15$:

k	a_k		b_k
6	1 ✔	0 ✔	1.0 ✔
5	2 ✔	-1.15 ✔	0.85 ✔
4	3 ✔	-0.9775 ✔	2.0225 ✔
3	4 ✔	-2.325875 ✔	1.674125 ✔
2	5 ✔	-1.925244 ✔	3.074756 ✔
1	6 ✔	-3.535969 ✔	2.464031 ✔
0	-7 ✔	-2.833636 ✔	-9.833636 ✔

Accordingly,

$f(-1.15) \doteq$ -9.833636 ✔ .

Check