

Mathematics Homework Sheet 4

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Problem 1

Question is asking to find Bezout coefficients.

$$\begin{aligned} 1552303 &= 6 \cdot 233927 + 148741, & u_2 &= u_0 - 6u_1 = 1, & v_2 &= v_0 - 6v_1 = -6 \\ 233927 &= 1 \cdot 148741 + 85186, & u_3 &= u_1 - u_2 = -1, & v_3 &= v_1 - v_2 = 7 \\ 148741 &= 1 \cdot 85186 + 63555, & u_4 &= u_2 - u_3 = 2, & v_4 &= v_2 - v_3 = -13 \\ 85186 &= 1 \cdot 63555 + 21631, & u_5 &= u_3 - u_4 = -3, & v_5 &= v_3 - v_4 = 20 \\ 63555 &= 2 \cdot 21631 + 20293, & u_6 &= u_4 - 2u_5 = 8, & v_6 &= v_4 - 2v_5 = -53 \\ 21631 &= 1 \cdot 20293 + 1338, & u_7 &= u_5 - u_6 = -11, & v_7 &= v_5 - v_6 = 73 \\ 20293 &= 15 \cdot 1338 + 223, & u_8 &= u_6 - 15u_7 = 173, & v_8 &= v_6 - 15v_7 = -1148 \\ 1338 &= 6 \cdot 223 + 0, \end{aligned}$$

Which means that $(1552303, 233927) = 223$. And we have the Bezout coefficients $u_8 = 173, v_8 = -1148$

$$1552303 \cdot 173 + 233927 \cdot (-1148) = 223$$

Thus $m = 173, n = -1148$.