Advanced Number Theory

Click on a question number to see how your answers were marked and, where available, full solutions.

Question Number	Score
1	3 / 3
2	3 / 3
3	1 / 1
4	1 / 1
5	1 / 1
6	1 / 1
Total	**10 / 10 (100%)**

Performance Summary

Exam Name:	Advanced Number Theory
Session ID:	0654725731
Exam Start:	Wed Jun 12 2024 16:20:11
Exam Stop:	Wed Jun 12 2024 16:31:21
Time Spent:	0:11:10

Question 1

Bézout Coefficients

Find the Bézout coefficients and the gcd of 45 and 33:

3 ✔ Expected answer: 3 $\times 45+$

-4 ✔ Expected answer: -4 $\times 33 =$

3 ✔ Expected answer: 3

a

✔ Your answer is correct.

b

✔ Your answer is correct.

gcd

✔ Your answer is correct.

You scored **3** marks for this part.

Score: 3/3 ✔

Question 2

Bézout Coefficients

Find the Bézout coefficients and the gcd of 29 and 100:

-31 ✔ Expected answer: -31 $\times 29+$

9 ✔ Expected answer: 9 $\times 100 =$

1 ✔ Expected answer: 1

a

✔ Your answer is correct.

b

✔ Your answer is correct.

gcd

✔ Your answer is correct.

You scored **3** marks for this part.

Score: 3/3 ✔

Question 3

Modular Inverse

What is the modular inverse of $50 \mod 39$? (Make sure the number is between 0 and 38).

32 ✔ Expected answer: 32

✔ Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

Question 4

Modular Inverse

What is the modular inverse of $41 \mod 75$? (Make sure the number is between 0 and 74).

11 ✔ Expected answer: 11

✔ Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

Question 5

Modular Inverse

Solve for x in $75x \equiv 42 \mod 88$? so that x is between 0 and 87.

78 ✔ Expected answer: 78

✔ Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

Question 6

Modular Inverse

Solve for x in $57x \equiv 26 \mod 47$? so that x is between 0 and 46.

12 ✔ Expected answer: 12

✔ Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

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