Problem 1. **(6 points)**

In this problem, you will enter the unique quotient and remainder guaranteed by the division algorithm: write the quotient in the place marked *div* and the remainder in the place marked *mod* . For example, given the numbers 26 and 7, the division algorithm allows us to write 26 = q 7 + r where q = 3 and r = 5. Enter the value of q for 26 *div* 7. Enter the value of r for 26 *mod* 7.

30 div 8 = _____,
30 mod 8 = _____

-21 div 8 = _____,
-21 mod 8 = _____

27 div 5 = _____,
27 mod 5 = _____

-21 div 9 = _____,
-21 mod 9 = _____

28 div 10 = _____,
28 mod 10 = _____

-28 div 6 = _____,
-28 mod 6 = _____

790465855 mod 101 = _____

686169072 mod 101 = _____

Answer(s) submitted:

- 3
- 6
- -3
- 3
- 5
- 2
- -3
- 6
- 2
- 8
- -5
- 2
- 61
- 19

submitted: (correct)
recorded: (correct)

Problem 2. **(6 points)**

Compute the remainder when the following large integers are divided by the given divisor. That is, find r.

378573817 mod 10 = _____

715005983 mod 10 = _____

648269910 mod 100 = _____

154422942 mod 100 = _____

638230173 mod 101 = _____

619845384 mod 101 = _____

Answer(s) submitted:

- 7
- 3
- 10
- 42
- 63
- 1

submitted: (correct)
recorded: (correct)

Problem 3. **(3 points)**

What are the greatest common divisors of the following pairs of integers?
(a) $2^3 \cdot 3^2 \cdot 5^5$ and $2^3 \cdot 3^2 \cdot 5^4$
Answer = _____

(b) $2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13$ and $5 \cdot 7^3 \cdot 11^{10} \cdot 17$
Answer = _____

(c) $2^3 \cdot 7$ and $5^2 \cdot 13$
Answer = _____
Answer(s) submitted:

- 45000
- 385
- 1

submitted: (correct)
recorded: (correct)

Problem 4. **(2 points)**

Compute:

$\gcd(72,38) =$ _____

Find a pair of integers x and y such that $72x+38y = \gcd(72,38)$

$(x,y) = (\ \_\_\ ,\ \_\_\ )$

Answer(s) submitted:

- 2
- 9; −17

submitted: (correct)
recorded: (correct)

Problem 5. **(2 points)**

Determine the greatest common divisor of 357 and 221.

$\gcd(357,221) =$ ___

Answer(s) submitted:

- 17

submitted: (correct)
recorded: (correct)

Problem 6. **(6 points)**

Use the Euclidean algorithm to find the greatest common divisors of each pair of numbers below.

$\gcd(1357,2419) =$ ___
$\gcd(901,1961) =$ ___
$\gcd(527,799) =$ ___

Answer(s) submitted:

- 59
- 53
- 17

submitted: (correct)
recorded: (correct)