Representations of Integers **Worksheet 1**

Name: **Date:**

1. Express the binary number 110111011_2 in decimals.

$= 2^8 + 2^7 + 2^5 + 2^4 + 2^3 + 2^1 + 1$

$= 443_{10}$

2. Express the decimal number 567_{10} in binary. Determine the number of bits needed to express the number.

$567 = 2(283) + 1$ 1's bit

$283 = 2(141) + 1$ 2's bit

$141 = 2(70) + 1$ 4's bit

$70 = 2(35) + 0$ 8's bit

$35 = 2(17) + 1$ 16's bit

$17 = 2(8) + 1$

$8 = 2(4) + 0$

$4 = 2(2) + 0$

$2 = 2(1) + 0$ $1 = 2(0) + 1$

1000110111_2

3. Express the hexadecimal number $4B07A_{16}$ in decimals.

307322

4. Express the decimal number 514679_{10} in hexadecimal.

$514679 = 16(32167) + 7$ 1's bit

$32167 = 16(2010) + 7$ 16's "

$2010 = 16(125) + 10$ 16^2's bit

$125 = 16(7) + 13$ 16^3's bit

$7 = 16(0) + 7$ 16^4's "

$7DA77_{16}$