► **Problem 4.2-12(g)(j)** In each of the following cases, find the greatest common divisor of a and b and express it in the form $ma + nb$ for suitable integers m and n.

(g) $a = -3719$ and $b = 8416$.

(j) $a = 12345$ and $b = 54321$.

Solution. (g)

8416	1	0
3719	0	1
978	1	-2
785	-3	7
193	4	-9
13	-19	43
11	270	-611
2	-289	654
1	1715	-3881

The last nonzero remainder is 1, so $\gcd(8416, 3719) = 1 = (1715) \times (8461) + (-3881) \times (3719)$. Thus, $\gcd(-3719, 8416) = 1 = (3881) \times (-3719) + (1715) \times (8461)$.

(j)

54321	1	0
12345	0	1
4941	1	-4
2463	-2	9
15	5	-22
3	-822	3617

Since the last nonzero remainder is 3, $\gcd(12345, 54321) = 3 = (-822) \times (54321) + (3617) \times (12345)$. □