| −128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 |
|------|-----|-----|-----|-----|-----|-----|-----|
|      |     |     |     |     |     |     |     |

(a) An eight-position two's complement value box

| −128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 |
|------|-----|-----|-----|-----|-----|-----|-----|
| 1    | 0   | 0   | 0   | 0   | 0   | 1   | 1   |

−128                               +2     +1    = −125

(b) Convert binary 10000011 to decimal

| −128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 |
|------|-----|-----|-----|-----|-----|-----|-----|
| 1    | 0   | 0   | 0   | 1   | 0   | 0   | 0   |

−120 =    −128                   +8

(b) Convert decimal −120 to binary

**Figure 9.2  Use of a Value Box for Conversion
Between Twos Complement Binary and Decimal**

```
      1011
     ×1101
 00001011    1011 × 1 × 2⁰
 00000000    1011 × 0 × 2¹
 00101100    1011 × 1 × 2²
 01011000    1011 × 1 × 2³
 10001111
```

**Figure 9.10  Multiplication of Two Unsigned 4-Bit Integers Yielding an 8-Bit Result**