Example 2.0 The intercepts of a crystal plane with the *x*, *y* and *z*-axis defined by a set of unit vectors are at $2a_1$, $-3a_2$ and $4a_3$, where a_1, a_2 and a_3 are the magnitudes of the unit vectors. Find the corresponding Miller indices of this and all other crystal planes parallel to this plane.

Solution The Miller indices are obtained in the following three steps:

1. Identify the intersections with the axis, namely 2, -3 and 4
2. Calculate the inverse of each of those intercepts, resulting in 1/2, -1/3 and 1/4.
3. Find the smallest integers proportional to the inverse of the intercepts. Multiplying each fraction with the product of each of the intercepts (24 = 2 x 3 x 4) does result in integers, but not always the smallest integers. These are obtained in this case by multiplying each fraction by 12.

The Miller indices of this plane and all parallel planes are therefore $(6\bar{4}3)$. Note that the negative indices are indicated with a bar above the integer for a more compact notation.