

Section 1: Introduction to vectors

Exercise level 3 (Extension)

1. (i) How can you get from the origin to the point $(71, 33)$ using only integer multiples of the vectors $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$ and $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$?
- (ii) Prove that it is possible to get from the origin to any point (p, q) where p and q are integers, using only integer multiples of these two vectors.
- (iii) Show that it is not possible to get from the origin to the point $(71, 33)$ using only integer multiples of the vectors $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$ and $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$? What can you say about the points (p, q) that you can get to using integer multiples of these two vectors?