The vertical travel of the roller filing rest is a trigonometrical function of the movement of the crossslide feedscrew:

Let change in height = x
Distance moved by crossslide = y
(1 turn = 1 mm)

Therefore \( x = \frac{y}{\tan 30} \)
or \( x = \frac{y}{0.5774} \)

Project

To file a 5mm square on a 10mm diameter bar using the roller filing rest.

\[ D_1 = 10 \text{mm} \quad D_4 = 8.48 \text{mm} \]

\[ x = 2 \text{mm} \]

Distance moved by crossslide (y) = \( \frac{x}{\tan 30} \) = \( \frac{2}{0.5774} \)

Movement of crossslide feedscrew = 3.46 turns
or 3 turns and 18.4 divisions.
Ex. 2

Turn end of bar to \( D_e \) (across corners dimensions).

Material to be removed \( = \frac{D_e - A}{2} \)

\( = \frac{8.48 - 6}{2} \)

\( = 1.24 \text{mm} \)

\( \therefore x = 1.24 \text{mm} \)

Distance moved by crosslide (Y) = \( \frac{x}{\tan 30} = \frac{1.24}{0.5774} \)

Movement of crosslide feedscrew = 2.14 turns

or 2 turns and 5.6 divisions.